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EDITORIAL:

ETERNAL VIGILANCE IS THE PRICE

In the 1960s smallpox was an endemic disease in some 50 to 60 countries, and was periodically introduced into other countries by travellers from endemic areas. In 1967 WHO launched the Intensified Smallpox Eradication Programme, and with the collaboration of national health authorities, smallpox was progressively eradicated from one country after another until the last case of naturally acquired smallpox anywhere in the world occurred in Somalia in October 1977. Eradication of this ancient scourge of mankind is one of the greatest accomplishments of preventive medicine and is a tribute to international collaboration for human well-being.

In spite of the confidence engendered by the fact that nowhere has smallpox recurred after a country was declared free of the disease (including such 'high risk' areas as Indonesia, India and Bangladesh, where the last cases occurred in January 1972, May 1975 and October 1975, respectively) the World Health Organization has established an 'insurance policy' to guard against any possible unexpected happening that may cause smallpox to recur. This has several components. Active surveillance is being maintained in Zaire, where a related virus normally circulating in wild animals occasionally causes sporadic smallpox-like disease (human monkeypox) in humans. The laboratories in the USA and the USSR that provided diagnostic facilities for WHO throughout the eradication campaign maintain their capabilities. Special measures have been taken to destroy stocks of variola virus in all but a very small number of laboratories, in order to minimize the risk of escape of the virus from the laboratory. WHO has established a large reserve stock of freeze-dried smallpox vaccine located in three strategic places (Geneva, New Delhi, Toronto), and many national governments have established their own reserves.

The last case of endemic smallpox occurred in Malaysia in the 1950's (Figure 1 and 2). Prior to that time specimens for smallpox diagnosis were not uncommonly sent to hospitals, medical schools, or the Institute for Medical Research. Following common virological practice, aliquots of



Fig. 1. A young boy with typical smallpox lesions on the face.

some of these samples or virus recovered from them might have been put in the deep-freeze units in such laboratories for future reference. Some of these specimens may remain there, long since forgotten. Such material could be dangerous, and might at some future time constitute a source for further cases of human smallpox. National health authorities have been concerned about this possibility and have already collaborated with WHO in a survey designed to identify laboratories that were retaining variola virus. However, we believe that it would be wise for the directors of all laboratories where smallpox diagnosis was ever conducted once more to examine their deep-freeze storage cabinets for any such forgotten material and incinerate any ampoules that may contain variola virus or are not properly labelled.

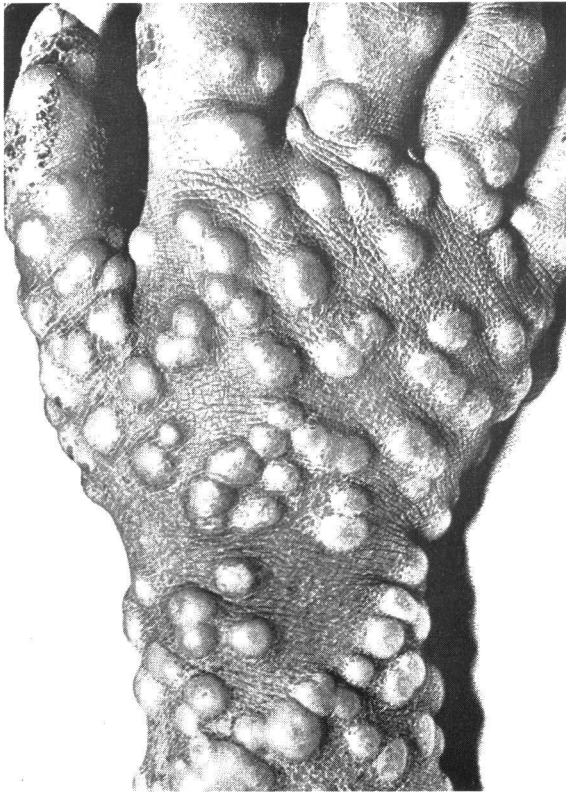


Fig. 2. Typical smallpox lesions on the dorsum of the hand and wrist.

The other way in which doctors in Malaysia can help with the global insurance against any possible recurrence of smallpox would be for them to be alert for any suspicious human case and obtain material for laboratory study, and to collect specimens from any wild animals found to have a pox-like infection. All such specimens should be sent to WHO, Geneva.

We believe that the world is now free of smallpox, forever, but the price of liberty is eternal vigilance, and against this disease it is the doctors who need to maintain this vigilance.

SMOKING IN TUTONG, BRUNEI: A CHANGING HABIT

ASHLEY A. WOODCOCK

INTRODUCTION

IT IS WIDELY BELIEVED that sun-cured tobaccos, with a lower tar and nitrate content than flue-cured tobaccos are less carcinogenic to man. Brunei is a previously relatively isolated state on the northern coast of Borneo. Cigarette smoking is a common habit, especially among older age groups, who make their own cigarettes from locally produced sun-cured tobaccos. Whilst there are large numbers of patients with chronic obstructive lung disease secondary to smoking, carcinoma of the lung is a rare disease.

With control of cigarette advertising in Western Countries, cigarette manufacturers are turning their attention to the lucrative markets in the developing countries of South-east Asia. Tobacco consumption in developing countries has not yet been influenced by health considerations.

It is important to define the size of the smoking problem and the smoking habits of the population so that a rational approach can be taken towards warning the population of the hazards of cigarette smoking.

METHODS

The State of Brunei is a previously isolated Sultanate on the north-east coast of Brunei. The smoking survey was carried out in Tutong town (the third largest town in Brunei) in conjunction with tuberculosis mass miniature X-ray campaign. The whole of the population aged over 14 answered a questionnaire verbally, to a senior member of the nursing team. All subjects were asked their age, sex, race and whether they were smokers or non-smokers. Smokers were asked the number of cigarettes smoked, the type or brand of cigarettes preferred, and the number of years they had been smoking. In addition, the blood pressure was taken (the results of the hypertension survey will be published later).

RESULTS

765 subjects (395 male, 370 female) answered

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the questionnaire. The racial distribution (Malay 61.3%, Chinese 36.4%, indigenous races (Dusun, Iban etc) 2.3% paralleled closely the Brunei population. More males (39.9%) than females (14.3%) smoked, and the frequency of smoking increased with age from 15.3% in the under-30 age group to 68.5% in the over-50 age group (Table I). Smoking of locally-produced sun-cured tobacco was common in the over-50 age group (52%) whereas almost all the smokers in the under-30 age group (93.9%) smoked cigarettes containing flue-cured tobacco. The 30-50 age group shared results intermediate between the older and younger groups, with 36.9% of this group smoking, of whom 70.9% smoked flue-cured tobaccos. Of the 208 who smoked, 69 (33.2%) smoked from 1-5 cigarettes, 46 (22.1%) smoked 6-10 cigarettes, 63 (30.3%) smoked 11-20 cigarettes and 30 (14.4%) smoked more than 20 cigarettes per day.

DISCUSSION

The multiple health hazards of tobacco-smoking are already widely described. As well as carcinoma of lung, ischaemic heart disease and chronic bronchitis, new hazards are discovered with regularity. Tobacco has for centuries been used all over the world, as a way of increasing the enjoyment of life or as an aid to coping with its pressures. A new development in the twentieth century has been the increasing use of cigarettes manufactured from flue-cured tobaccos (Fletcher & Horn 1970). Flue-cured tobaccos have a higher tar content and use nitrites in the curing process. The epidemic of lung carcinoma which is affecting all developed nations may be partly explained by the increased carcinogenic effects of flue-cured tobaccos in comparison with sun-cured tobaccos. With increasing control measures in the developed countries, tobacco companies have turned their attention to lucrative markets in the developing countries. The World Health Organisation has recently expressed concern that the tobacco companies are switching sales of high-tar cigarettes to the 'Third World' countries (WHO, 1978).

The results of the Brunei survey show that the incidence of smoking in the under-30 age group is very similar to rates found in surveys

TABLE I
SMOKING RELATED TO AGE AND TYPE OF CIGARETTES

Age in years	Total Sample	No. of Smokers	Percentage	No. Smoking	Percentage
			In Each Age Group Who Smoke	Mainly Flue-cured Tobacco	Smoking Mainly Flue-cured Tobacco
14 — 30	451	69	15.3%	65	93.9%
30 — 50	241	89	36.9%	63	70.9%
Over 50	73	50	68.5%	24	48.0%
Total	765	208	27.2%	155	74.5%

of Malaysian (Pathmanathan, 1975) and Scottish (Mckay *et al.*, 1973) students. The sex distribution with males smoking three times as frequently as females is similar to the Malaysian survey but differed from the Scottish results where almost as many females smoked as males. The great majority (93.9%) of the under-30 age group smoked cigarettes containing flue-cured tobacco. This was in contrast to the high proportion of smokers over 50 years old, who smoked locally-produced sun-cured tobaccos. Smoking of local sun-cured tobaccos is not popular amongst the young people of Brunei. A possible interpretation of the results is that as smokers get older, they switch to locally-produced tobaccos. It is much more likely that young people are attracted to commercially-produced cigarettes containing flue-cured tobaccos. That there is a trend towards cigarettes containing flue-cured tobacco is confirmed by the statistics for cigarette imports to Brunei. Imports of cigarettes containing flue-cured tobaccos have almost doubled over the past thirteen years (from 420,122 lbs in 1965 to 723,378 lbs in 1978). The trend towards flue-cured tobaccos must be confirmed by future surveys.

Of the diseases related to smoking, chronic bronchitis and cor pulmonale are common conditions, whereas carcinoma of the lung is very uncommon. In 1978, there were only eight histologically-proven male cases of carcinoma of lung in Brunei (Dr. R. Kay personal communication).

An additional four probable cases were picked up radiologically which did not come to biopsy or cytology (Dr A. Jones personal communication). This mortality rate of 10 per 100,000 is ap-

proximately one tenth of the United Kingdom rate for males of 106 per 100,000. The frequency of carcinoma of lung on mass miniature radiography in 1978 was only 1 in 8,000 in males over 45 years. This compares to a rate of 1.3 per 1000 in London men over 45 years (Nash, Morgan & Tonkins, 1961), 2.8 per 1000 in Philadelphia men over 45 (Boncot *et al.*, 1955) and 2.34 per 1000 in males over 60 in Edinburgh (Croftan and Douglas, 1975). The rarity of carcinoma of lung is surprising in view of the high incidence of cigarette smoking, and may be related to the popularity of smoking sun-cured tobacco in the older age group, though other factors such as absence of atmospheric pollution may be contributory. Carcinoma of the lung could become more common over the next few decades.

Having defined the extent of the problem and the smoking habits of the population, smoking controls can be attempted on several fronts.

Cigarette advertising should be more closely controlled. There is already a voluntary ban on cigarette advertising on television and in cinemas, but this should be extended to magazines and newspapers. Tar and nicotine contents of cigarettes should be specific on the packet and packs should carry health warnings in Malay and Chinese. Taxation should be increased, especially on high tar cigarettes. All hospitals and health institutions should become strict non-smoking areas. No smoking should be allowed in public areas eg. cinemas. All health workers should set an example by not smoking themselves and encouraging patients and their families to stop. An effective long-term health educa-

tion campaign should be mounted to warn the population of the hazards of cigarette smoking. Health workers should visit schools and colleges in an attempt to prevent young people starting smoking. The health authorities should co-operate with the armed forces, government departments, religious associations, and sports clubs in order to stress the health hazards of smoking.

Atkinson and Townsend (1977) have calculated that an increase in the price of cigarettes by 50%, in addition to restrictions on advertising and health education campaigns could cut cigarette consumption in the United Kingdom by 40%. Similar measures would prevent epidemics of carcinoma of the lung and other smoking related diseases in the developing countries. There is a unique opportunity for health protection and promotion in Brunei.

SUMMARY

Of 765 people aged over 14 years, living in Tutong, in the State of Brunei, 208 (27.2%) were regular cigarette smokers. In the over-50 age group, 68.5% were smokers, of whom just over half smoked locally produced cigarettes containing sun-cured tobacco. In the under-30 age group, only 15.3% were smokers, but almost

all of them (93.9%) smoked commercially-produced flue-cured cigarettes. The relationships of smoking habits and frequency of disease are studied and the possible effects on future health of increased sales of flue-cured tobaccos in South-east Asia are discussed.

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ECOLOGICAL FACTORS INFLUENCING THE GROWTH OF THE CHILD

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INTRODUCTION

Soon after it is born, the human child is exposed to a hostile world where a world variety of hazards influence not only the growth of the child but also its very survival. Early infancy is associated with a very high mortality rate only equaled in old age. The physical growth of the child is perhaps one of the most sensitive indices of the effect of ecological stresses on the child.

The general course and pattern of growth of each child is genetically predetermined. However strongly acting ecological influences can alter the course of physical growth. Perhaps the two most important of the ecological factors are the dietary intake of the child and the influence of infections and disease. Increase in size is primarily dependent upon an adequate food intake both in terms of quantity and quality. This itself is dependent upon a wide range of ecological factors the most important of which includes factors that influence food production, the distribution and availability of foods, cultural preferences and taboos in relation to foods and cultural habits regarding the preparation of foods (Fig. 1).

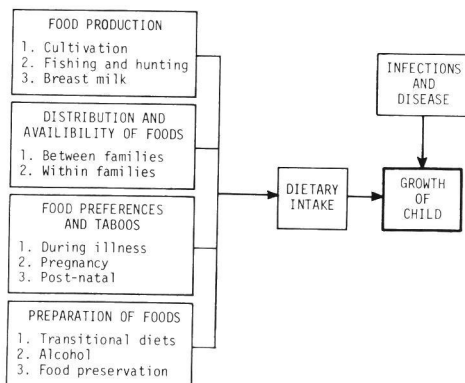


Fig. 1. Major ecological factors influencing the growth of the child.

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in Kuala Lumpur

Aside from an adequate dietary intake, the single most important ecological factor influencing the course of growth of a child is the stress placed upon it by infections and disease. Further these two powerful factors of inadequate dietary intake as well as infections often act synergistically in a cyclic fashion with one factor reinforcing the undermining action of the other. In the paragraphs that follow the influence of these ecological factors on the growth of the child is examined and illustrations are drawn from studies conducted in Sabah, Sarawak and Peninsular Malaysia.

FOOD PRODUCTION

Cultivation

In settled rural communities, the cultivation of staple foods such as rice, millet, tapioca, maize, potatoes and yams is the principal means of food production and is consequently an important preoccupation of the community. For example, in one coastal Dusun community studied in 1979, it was noted that rice, tapioca, Italian millet, sweet potato and maize were grown and consumed by the community (Table I). The importance of such staple foods is underlined by the fact that the main events of the year coincide with events in the planting cycle. Thus ploughing, planting, weeding, irrigation and harvesting are all associated with rituals and ceremonies conducted by spiritual specialists. For example at the time of planting the *monogit* ceremony is carried by coastal Dusuns. It not only ensures a good harvest but also aims to bring good fortune and health to the household symbolically protected by the *monogit* ceremony (Fig. 2).

Most other foods including most fruits and vegetables (Table II and III) are locally cultivated by the majority of rural communities. The consequence is that many foods particularly fruits and vegetables are peculiar to a local community who, being unfamiliar with other foods such as the soya bean, do not have the taste for such foods not the knowledge of how these unfamiliar foods should be prepared for consumption. It is thus absolutely essential that new agricultural and other food products be introduced as a "total package" that incorporates not only agricultural "know-how" but also knowledge concerning storage, preservation, preparation and presentation of that food.

Table I

Proportion of households that produce cereals and starchy foods and that eat it at least once weekly.

(Coastal Dusun community, Tuaran)

Cereals and starchy foods	Proportion producing the food	Proportion consuming it at least once weekly
Rice	1.0	1.0
Sugar and sweets	0	1.0
Rice wine (<i>tapai</i>)	0.8	0.8
Wheat flour	0	0.6
Biscuits	0	0.6
Glutinous rice	1.0	0.5
Italian millet	0.4	0.4
Tapioca	0.5	0.3
Honey	0.3	0.2
Sweet potato	0.4	0.2
Maize	0.3	0.1

Table II

Proportion of households that grow fruits and that eat it at least once weekly (Coastal Dusun community, Tuaran)

Fruits	Proportion growing the fruit	Proportion eating it at least once weekly
Bananas	1.0	0.7
Papaya	0	0.7
Pineapples	0.8	0.3
Jackfruit	0.4	0.2
<i>Anona muricata</i> (<i>durian belanda</i>)	0.7	0.2
Rambutan	0.5	*
<i>Baccaurea motleyana</i> (<i>rambai</i>)	0.5	*
Mangosteen	0.4	*
<i>Lansium domesticum</i> (<i>langsai</i>)	0.4	*
<i>Putorius nudipes</i> (<i>pulasan</i>)	0.3	*

* Available irregularly



Fig. 2. At the start of the planting season, a Dusun family sit together on the floor during the *monogit* ceremony conducted by 4 sword-wielding *bobolian* [spirit specialists] who symbolically hold an inverted tray over their heads signifying protection against misfortune, ill-health and famine. A white cockerel, lying on the tray, has just been sacrificed as an offering to the spirits to ensure a plentiful harvest, good fortune and health.

Table III

Proportion of households that grow vegetables and that consume it at least once weekly (Coastal Dusun community, Tuaran)

Vegetables	Proportion growing the food	Proportion consuming it at least once weekly
Banana spadix (<i>jantung pisang</i>)	1.0	0.9
Fern shoots (<i>pucuk paku</i>)	0.6	0.4
Brinjal	0.5	0.4
Spinach	0.4	0.4
Long beans	0.4	0.3
Mushrooms	0.7	0.3
Ipomea leaves	0.3	0.3
Cucumber	0.1	0.3
Jackfruit pistil (<i>pucuk nangka</i>)	0.4	0.2
Bamboo shoots	0.3	0.1
Mustard leaves (<i>sawi</i>)	0.1	0.1
Cabbage	0	0.2
Carrots	0	0.1

Domestic Animals

In considering the problem of food production, the place of domestic animals in the supply of foods should not be neglected (Table IV). Where there is sufficient land many of these animals are allowed to wander around foraging for their own food. This non-intensive method naturally results in a relatively low production of animal proteins. However it has the advantage that available cereals and other foods are not deliberately turned into animal fodder. In the process of converting cereals into animal meat, approximately 85% of the calories contained in the grain are lost in terms of human nutrition (Matze, 1979). Recently there have been moves by sanitarians to require for mainly aesthetic reasons, that domestic pigs be penned in an enclosure. This ill-conceived notion has not only removed the scavenger action of the pig but also resulted in either a greater loss of calories, in term of human nutrition in the form of grain lost as animal feed, or in a decrease in the number of pigs from lack of food supplies denied to pigs penned in an enclosure.

Table IV

Proportion of households that self-produce fish, meat and eggs and that consume it at least once a week (Coastal Dusun community, Tuaran)

Fish, meat and eggs	Proportion producing the food item	Proportion eating it at least once weekly
Fresh fish	@	0.9
Eggs	1.0	0.7
Salted fish	0	0.6
White bait (<i>ikan bilis</i>)	0	0.2
Chicken	1.0	0.1
Ducks	0.2	0.03
Mutton	0.7	*
Beef	0.3	*
Pork	0.2	*
Deer	@	*
Wild boar	@	*
Bamboo rat	@	*
Squirrel	@	*
Monkey	@	*
Turtle	@	*
Snake	@	*
Iguana	@	*
Small birds	@	*

* Available irregularly

@ fishing or hunting is carried out by 5-15% of the households

Fishing and Hunting

Fishing and hunting for animal proteins can add valuable protein to supplement the diets of those who live close to sources of such foods. In many coastal communities the principal source of animal proteins is the fish. In the coastal Dusun community that was studied, it was noted that (Table IV) fish, in the form of fresh fish, salted fish and white bait, constituted the principal source of animal protein for all persons after infancy.

It should be noted that even though buffaloes, goats and pigs are reared, the consumption of these is relatively low and that these animals are often sold for cash or are slaughtered only at festivals and for rituals.

Hunting for wild animals and birds, particularly the small ones, is an important activity in jungle fringe communities that are in short supply of proteins. About 15% of all the families in the coastal Dusun community that was studied (Table IV), supplemented their diets by hunting for animals and birds. In jungle and jungle fringe communities almost all families hunt for food. Consequently, the hunting dog is an important member of the household in these communities.

Breast Milk

The importance of breast milk as a source of food for the young child cannot be overemphasised. There is no doubt at all that breast milk is the safest and best food for the young infant. Studies have demonstrated that breast milk has specific nutritional and anti-infective properties and that breast-feeding is associated with lower rates of attack and death from infectious disease. In one study, it was noted (Kanaaneth, 1972) that malnutrition was practically absent among breast-fed infants while about 30% of bottle-fed infants were found to be malnourished. Plank and Milanese (1973) noted that bottle-feeding is associated with three times as many death as compared with infants who have been wholly breast-fed.

The irony of it is that in developing countries such as Malaysia where breast-feeding is most needed, there are indications that there is a decline in the proportion of women who breast-feed their infants. The decline is most marked among urban women particularly urban Chinese women. About half the urban Malay and Indian women and two-thirds of urban Chinese women who began breast-feeding their infants had ceased to do so within three months of childbirth (Pathmanathan, 1979). Although the decline of breast-feeding is less marked among rural women, it was found that nine months after childbirth only 50% of rural Malay women, 21% of rural Indian women and 19% of rural Chinese women were still breast-feeding their infants.

The high cost of packaged milks, set against the low incomes characteristic of the developing countries, leads mothers to use dilute preparations far below those recommended by the manufacturers. Thus in the economically poorer areas of the world, the use of anything other than breast milk often amounts to a death sentence for the young infant.

DISTRIBUTION AND AVAILABILITY OF FOODS

Between Families

The wide differences in the availability of foods between different countries and between different communities in the same country have been well documented. For example, it has been estimated (Matze, 1979) that the average annual per capita consumption of animal protein is about 20-25 kg. in the industrial countries as opposed to only about 1 kg. in the Asian and African countries.

Malnutrition is not always due to insufficient food production. Unemployment, poverty and the lack of purchasing power can lead to low food production. Only those who have income (and employment) have purchasing power. In other words, socio-economic conditions are of paramount importance. The National Household Expenditure Survey, Malaysia has shown that rural households with an income of less than M\$200.00 spent 52.6% of their income on food of which 45% was spent on rice, bread and other cereals and 19% on fish and meat, while higher income rural households with an income of M\$600.00 or more spent 26.7% on their income on food of which 28% was spent on rice, bread and other cereals while 33% was spent on meat and fish. On the other hand, the urban poor with an income of less than M\$200.00 spent 39.5% of the income on food of which 33% was spent on rice, bread and other cereals and 30% on fish and meat, indicating that unlike the rural poor, the urban poor spent more on protein foods. However since urban prices are higher it is not clear whether they finally ended with a more nutritious diet, although this may seem to be the case. The problem of hunger cannot be solved in the long run without the creation of jobs and the resultant increase in the purchasing power of the poor.

Within Families

In many communities, adult men are served first while women and children eat only after the men have finished. When there is a shortage of food, it is the women and children who go hungry.

In some Orang Asli communities, when a large animal such as a deer is caught, the flesh is usually taboo to the children and women of childbearing age. Thus only the men and elderly women benefit from this protein boost. Among the deep jungle Semai young children are allowed to eat small animals and fishes including small birds, water snails,

toads, and frogs. However all larger animals and birds are taboo. It is believed that the flesh of these animals will cause *sawan* (convulsions) if eaten by children. After they are over 4 years of age, wild pigs and the meat of animals with "stronger spirits" may be added. Between the ages of 10 years and 20 years the list begins to grow larger and the leaf monkey, bats, civets, anteater, deer, turtle, tortoise, bear and the larger birds such as owls, hawks and hornbills are added. By the age of 25 years, almost all animals may be eaten. Elderly men and postmenopausal women have the minimum of restrictions. Pregnant and lactating women have numerous food taboos (Bolton, 1972). Consequently, it is the growing child and the pregnant and lactating women who are least likely to receive the foods that they so very much require. Bolton (1972) reports that the plasma albumin levels of women are lower than those of men and that women of childbearing age have the lowest plasma albumin levels among the adults.

FOOD PREFERENCES AND TABOOS

During illness

Many foods, whether they be classified culturally as foods that are "cooling" or that "carry wind", may be eaten with impunity during good health. However the same foods are carefully avoided when the individual becomes ill (Chen, 1977). Thus beef is ordinarily harmless but becomes *bisa* (poisonous) when one has any cuts or skin rashes. Wilson (1971) notes that among Trengganu Malays peanuts and eggs are *bisa* for people with open sores; cashew nuts should not be eaten if one has scabies; egg plant, chicken or fried bananas are *bisa* for people with stomach troubles; mutton is not good for a cough; soursop is bad for influenza; beef, mutton, mackerel, cucumbers and watermelon are bad for boils; vinegar and soya sauce are bad for asthma; and that fish soya sauce, peanuts, ducks and prawns are dangerous for *seduan* (a Malay defined disease resembling sinus trouble). McKay (1971) records that in Trengganu *langsats* (*Lansium domesticum*) together with other sour-tasting fruits are bad for malaria and that *langsats* and fern shoots are bad for worms. It has also been noted (Chen, 1972) that papaya, and other carotene-rich foods are believed to be bad when a child develops night-blindness due to vitamin A deficiency. The child is thus deprived of carotene-rich foods when he most needs it.

During Pregnancy and the Postnatal Period

The WHO Expert Committee on Nutrition in Pregnancy and Lactation (1965) notes that "It seems reasonable to conclude that under-nutrition and malnutrition among mothers, especially in the developing countries, contribute towards impaired maternal, foetal and infant health and vitality".

Undernourished women produce smaller babies which have a higher death rate. Chong *et al.* (1968) investigating the nutritional status of one hundred pregnant mothers from lower-income urban groups, noted that their diets were most deficient in thiamine, iron and riboflavine, and that niacin, ascorbic acid and calcium were also inadequate. The situation among rural pregnant women would be even worse.

Among the Dusun of Tuaran it is believed that a pregnant woman should not eat too much rice or she will have difficulty at childbirth; she should not take alcohol, fruits with a flaw in the skin or flesh and the flesh of animals that have not been slaughtered or the child will be born with a congenital defect; she should not take alcohol or pineapples lest she abort; she should not eat paired fruits or she will have twins; she should avoid turtle eggs or the child will be born with "flat feet" and a "soft head"; she should not eat small white fish or the newborn will suffer from convulsions and epilepsy; and she should avoid most fruits as these are "cooling" and she will be ill.

After childbirth, dietary restrictions are far more severe than during pregnancy when there are in fact very few restrictions. For example, among rural Malays during the first forty-four days after childbirth, it is believed that the mother's body is especially vulnerable to "cooling" foods (Chen, 1973) such as pineapple, citrus fruits, cucumbers, papayas and most green leafy vegetables which are in effect good sources of carotene (Chong and Soh, 1969). In addition, foods that are said to be *bisa* (poisonous) such as prawns, catfish, cuttlefish, cockles, *belachan* (anchovy paste) and certain types of fish, as well as foods that are reputed to "carry wind" such as cassava, cassava tips, sweet potatoes, pumpkin, taro, maize and jack-fruit are avoided. On the other hand, "heating" foods such as pepper, chillies, smoked or salted fish, eggs, and coffees are advocated.

In practice, the resulting diet, especially in remoter areas of the east coast of Peninsular Malaysia, consists of rice, pepper, chillies, dried or salted fish, and coffee. Such a restricted diet has been found to result in low serum levels for folic acid, carotene and iron (Wilson *et al.*, 1970). This is not surprising in view of the generally deficient diet even without these taboos (Chen, 1973).

Wilson (1973) compared the nutrient composition of food consumed by a rural Malay woman 28 days after confinement and noted that the intake of calcium, thiamine, riboflavine, vitamin A and ascorbic acid was low and a cause of concern.

Among the coastal Dusun of Tuaran, it is believed that post-natal women should not eat cold left-overs, gourds, pumpkin, cucumber, most fruits and all sour foods as these carry "wind" and

may be "cooling" and cause varicose veins. Large fishes, prawns and crabs are also taboo as they are "poisonous" and cause skin reactions. "Hanging" vegetables such as gourds and long beans have to be avoided since they are believed to cause uterine prolapse, while maize is believed to cause the teeth to fall out, mushrooms to be associated with rapid aging and eels and catfish are thought to change the sexual organs of the woman into male organs. Green leafy vegetables are taboo to mothers as these are believed to be responsible for the green colour seen in the stools of some newborns.

PREPARATION OF FOODS

Transitional Diets

The toddler is perhaps the most vulnerable of the whole family. He is the subject of a dietary transition when the breast is to be denied to him while he is expected to fully participate in adult meals. The toddler, during this transition phase, is often mistaken to be a "mini-adult", and is served small portions of the adult diet which is usually too spicy and too tough for him. He needs his foods sufficiently ground up to be digestible. He also needs to be introduced to spices in a slow and staggered fashion.

During this transition state, malnutrition is often enhanced by the fact that the toddler may be allowed to replace many of his meals with snacks and cakes which are generally high in carbohydrates but low in protein and vitamins. McArthur (1962) noted that many Malay school children went to school without breakfast and that virtually all the children spent pocket money on snacks. Rosemary Firth (1966) noted that children ate a great quantity of snacks, and that the Malay parent often realised that he was extravagant in spending money on sweet meats. "If I am hungry, and there is no money, I keep quiet. But Mahmat, he must have his every day." "Every now and again I am presented with a bill for our son." Wilson (1971) notes that in Trengganu some women makes cakes and carry them from house to house to sell, especially in the morning and that all these snacks provide a considerable amount of food energy.

Added to this, environmental conditions tend to expose the child to large doses of organisms. It has been noted that feeding utensils as well as prepared foods are often contaminated with faecal organisms indicating the difficulty in preparing a clean feed for children particularly bottle-fed infants.

Alcohol

In many communities in Sarawak and Sabah home brewed rice wine known as *tuak* or *tapai* is regularly consumed. In one coastal Dusun community it was found that 80% of the households produce rice wine for their own consumption and

drank this wine at least once a week. The principal drinkers are of course the adults. However it was noted that children of 3 to 4 years of age begin to share and drink small quantities from the glasses of their parents. In one unusual instance, a young child of 8 years presented with cirrhosis of the liver after he had been regularly fed on the residues of discarded rice salvaged from the wine jars.

Food Preservation

Many rural communities living in deep jungle or on jungle fringes supplement their diet with animals and fishes that they have hunted. Small quantities are normally eaten that same day and usually present few problems. Larger catches of fish and larger animals cannot be consumed by the family on the same day and may be preserved by salting and fermentation to form *jarok*. Salted fish is extremely popular among the rural people, many of whom have found their own ways to pickle fruits and vegetables.

However, the nomadic Punans of Sarawak, who are hunter-gatherers, have neither the skills nor the materials such as salt to preserve surplus foods for the lean days. Once a large animal such as wild boar has been caught it is immediately cooked and all members of the group gorge themselves until they become sick. Within a day or two most members have developed gastroenteritis. In between these episodes of over-eating, there are the usual lean days when there is almost no food other than a few roots and small creatures found by the women and children. To overcome their hunger, they fill their bellies with water. As they are nomadic, there is not staple grain or crop that they can depend on. Toddler mortality is extremely high. Attempts to settle them in fixed localities have so far been unsuccessful as these Punans have no knowledge or skills for a settled agricultural life.

INFECTIONS AND DISEASE

The effects of infections on the growth of the child differ according to the nature of the agent, the site affected and the age or physiologic state of the host. Children in the developing world not only carry a much heavier and more varied burden of infections but are also nutritionally in a more precarious state. Thus an infection which would have little or no effect of itself particularly in well nourished children in economically advantaged countries, is often sufficient to precipitate acute malnutrition in the children or the poorer areas of the developing world. For example in 1971, in the University Hospital, Kuala Lumpur, it was noted (Chen, 1974) that 66% of children aged 1 to 4 years admitted for infections could be classified as underweight and that 13% could be classified as suffering from severe protein calorie malnutrition. The two most common intercurrent infections were

gastroenteritis and respiratory tract infections.

Where infection and malnutrition interact for any length of time, growth may be severely retarded. Where infections precipitate kwashiorkor, damage may be serious. Infections alter not only the absorption, metabolism, and the excretion of various nutrients, but they also interfere with food intake as a consequence of the loss of appetite. In addition, it is often customary for solid foods to be withdrawn and for many foods to become taboo, so that nutrients are often reduced. Further it is often customary to prescribe purgatives which interfere with absorption and the utilisation of nutrients. Consequently, unless efforts are directed at both dietary intake as well as infections, the two act in a synergistically supportive fashion reinforcing each other while the health of the child spirals down-hill towards death.

SUMMARY

The general course and pattern of growth of each child is genetically predetermined. However strongly acting ecological forces can alter this course of physical growth. The two most important ecological factors are the dietary intake of the child and the influence of infections and disease on the child. Dietary intake itself is dependant upon food production, the distribution and availability of foods, cultural preferences and taboos, and the customary ways in which foods are prepared and presented.

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ATTENDANCES AT AN OUTPATIENT DEPARTMENT OF A DISTRICT HOSPITAL

John T. Arokiasamy

INTRODUCTION

Over the recent years, the hospital has been transformed from a "centre for dying" into a vital centre for providing treatment. Outpatient care in particular has grown in importance, serving as both an entry and exit point for hospital care. In Malaysia, use of outpatient services is increasing. Outpatient attendances in government hospitals and other government facilities was 730 per 1000 population in 1955, but by 1975, the attendances had increased to 1164 per 1000 population.

With the increasing demands placed on outpatient departments of hospitals to provide services to the people, it is important that the quality of care is maintained under these circumstances. The hospital outpatient department needs to monitor the characteristics of the patients attending it. There is a need for it to develop a profile of its patient population, know its service area, and the extent of Utilization of the services. This paper examines the characteristics of new cases attending the outpatient department of a district hospital and discusses the findings obtained in comparison to findings of other studies.

BACKGROUND

Government medical services in Peninsular Malaysia, formerly known as Malaya, started in large towns around 1880, (Malaya, 1951). By 1900, hospitals were built in most towns of the peninsula. The period 1910 to 1940 saw the progressive expansion of government medical services with the building of hospitals.

Each health district in the peninsula has one district hospital, which provides facilities for medicine, surgery, radiology, obstetrics, and special services. The district hospital also receives referral cases from components of the rural health system which comprise of main health centres, health sub-centres, and midwife clinics (Jayesuria, 1967). The district hospital in turn refers cases to the general hospital, of which there is one in every state.

To meet the increasing demands placed on the district hospital and to minimise referral to the general hospital, the number of doctors with post-graduate qualifications has been increased in district hospitals, and consultants from the general hospital visit these district hospitals at regular intervals.

PROCEDURE

Study Area

The study was conducted in the outpatient department of a district hospital established in 1967 and located in Trengganu. The hospital which has a bed capacity of 78 beds provides both outpatient and inpatient care, serving an estimated 62,000 persons, who are largely rural and predominantly Malay. It has three medical officers and on an average, 174 patients are seen at the outpatient department on a working day, approximately 25 of which are new cases. The nearest health facility health sub-centre 14 miles away.

Data Collection

The aim of the study was to determine the characteristics of new patients presenting themselves at the outpatient department for treatment, their means of travel and the distances involved. To obtain this information, a sample of outpatients was selected for study. The sample consisted of all those who attended the outpatient department of this district hospital for the first time during a selected period of ten working days. A total of 165 new cases were thus selected. Of these, 102 were adults and unaccompanied children, while 63 were children accompanied by an adult. The 102 cases and 63 accompanying adults were interviewed, the response rate being 100 per cent. A breakdown of the 63 accompanying adults shows that seven were the fathers of the cases, 37 were the mothers, nine were grandparents, and 10 were either uncles, aunts, friends, or distant relatives.

Findings

The age distribution of the 165 outpatients is presented in Table I. Of the 165 patients, nine (5.5%) were below one year of age, 29 (17.6%) between one to four years, 36 (21.8%) between five to fourteen years, 52 (31.5%) between 15 to 24 years, 24 (14.5%) between 25 to 44 years, 11 (6.7%) be-

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tween 45 to 64 years and four (2.4%) between 65 to 74 years. In this study 126 (76.4%) patients were below 25 years of age. The mean age of this sample is 19.5 years.

Table I

Age Distribution of the 165 Outpatients		
Age (years)	Number	Percentage
Less than 1	9	5.5
1 - 4	29	17.6
5 - 14	36	21.8
15 - 24	52	31.5
25 - 44	24	14.5
45 - 64	11	6.7
65 - 74	4	2.4
Total	165	100.0

There were 99 (60%) males and 66 (40%) females, giving a male to female ratio of 3:2, and 150 (90.9%) Malays, 13 (7.9%) Chinese and two (1.2%) Indians. One hundred and sixteen (70.3%) patients were unmarried, while 45 (27.3%) were married, two (1.2%) were divorced and two (1.2%) were widowed.

Of the 165 patients, 71 (43%) had no formal education and were unable to read or write, while 94 (57%) had education ranging from standard one to university level. A breakdown of these 94 patients shows that 47 had primary education, 42 secondary education between form one and form five, while two had done their higher school certificate. Two others had technical and vocational training after completing form five, and one had completed university education.

The monthly income of the family of the patients is given in Table II in Malaysian Ringgit. Incomes vary from none (in the cases of single individual families) to \$3000. One hundred and forty eight (84.8%) respondents had family incomes of up to \$350 per month while the median monthly family income of the sample was \$176.17 cts. Family size in this sample varied from one to 15 with an average of 4.8. One hundred and fifty patients (90.9%) belonged to families of size three or more.

The occupations of the patients, except for 45 who had not attained school going age, was varied. A breakdown of the occupations of the 120 individuals showed that 50 were students, 12 were housewives, 19 were rubber tappers and labourers, 12 were either foremen, mechanics, drivers, carpenters, trishawmen or fishermen, 11 were either businessmen, cashiers, shop assistants or cake sellers, while six were either government officials or teachers, and 10 were unemployed.

Table II

Monthly Family Income of the 165 Outpatients		
Income*	Number	Percentage
Less than \$50	2	1.2
50 - 99	20	12.1
100 - 149	45	27.3
150 - 199	30	18.2
200 - 249	26	15.8
250 - 299	8	4.8
300 - 349	17	10.3
350 - 399	3	1.8
400 - 499	2	1.2
500 - 599	4	2.4
\$600 and more	8	4.8
Total	165	99.9

* Income in Malaysian Ringgit.

Ninety eight patients (59.4%) stated that the district hospital was the nearest health facility to their homes. Twenty five (15.2%) lived near a mid-wife clinic, 23 (13.9%) near a sub-centre, six (3.6%) near a *Klinik Desa* (a rural clinic manned by a community nurse or *Jururawat Desa*), while seven lived near an estate clinic. Two patients lived near a stopping point of the government travelling dispensary but otherwise lived near no known health facility. In general, 33 patients (20.0%) lived within a mile of a health facility, 47 (28.5%) from one to two miles, 45 (27.3%) from two to three miles, nine (5.5%) from three to four miles, 22 (13.3%) from four to five miles and the remaining nine patients lived five miles or more from their nearest facility.

The patients were asked the distance of their homes from the district hospital and the observations are presented in Figure I. One hundred and one of them (61.2%) lived within five miles of the hospital and of these, 84 (83.2%) lived within three miles. Of the 64 who lived five miles or more from the hospital five (7.8%) lived five to nine miles away, 40 (62.5%) lived 10 to 19.9 miles away, 10 (15.6%) lived 20 to 29.9 miles away, four (6.3%) lived 30 to 39.9 miles away and five (7.8%) lived 40 to 49.9 miles away.

Table III shows the mode of transport used to attend the hospital. It was observed that 52 (31.5%) came by bus, 30 (18.2%) walked, 29 (17.6%) came by car (personal, friend's or company's), 22 (13.3%) by trishaw, 21 (12.7%) by bicycle, six (3.6%) by boat and either a bus or taxi, four by motorcycle and one by taxi. The bus was the most common mode of transport used by the

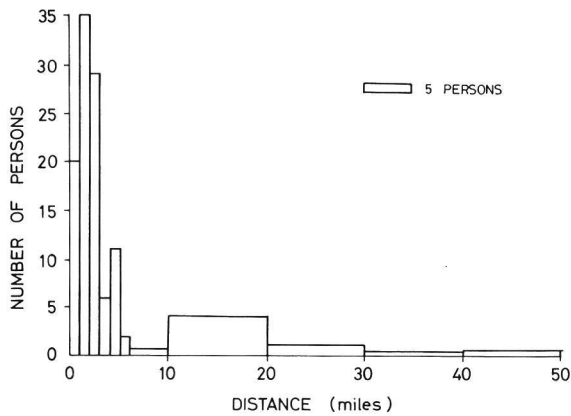


Fig. 1. Distance travelled by the Respondents from home to the hospital

respondents, followed by walking, car, trishaw and bicycle. In this study 80 patients used public transportation (bus, taxi, trishaw) to reach the hospital and the amounts spent varied from 10 cents to \$7.50 cts one way with a median amount of \$0.82 cts. Fifty four (67.5%) out of these 80 patients spent up to a dollar to get to the hospital.

Table III
Mode of Transport to Hospital

Transport	Number	%
Bus	52	31.5
Walking	30	18.2
Car	29	17.6
Trishaw	22	13.3
Bicycle	21	12.7
Others*	11	6.6
Total	165	99.9

* Includes Boat + Bus; Boat + Taxi; motorcycle; taxi

On analysis of the information on the person responsible for the patient coming to hospital, it was found that the persons quoted most often by the patients were parents in 71 (43.0%) instances. Fifty four respondents (32.7%) said that they themselves decided to come to hospital, seven said that grandparents were responsible, seven more said their spouse was responsible, while six said that medical staff were responsible. A further 10 patients said that their teachers sent them to the hospital, and ten identified friends, relatives, and others as being responsible for their coming to hospital.

Fifty eight persons (35.2%) suffered from respiratory tract illnesses, and of these 11 were below four years of age, 16 between 5-14 years, 29 between 15-44 years and two above 45 years. The male:female ratio of these 58 persons was 2.2:1 (40

males: 18 females). Gastrointestinal diseases were found in 45 (27.3%) cases, the majority of them (21 cases) being under four years of age. Diseases of the skin, muscles and bones were the next most frequent (35 cases, 21.2%), being prominent in the age group 5-44 years (26 cases), while other less commonly manifested illnesses were pyrexias of unknown origin, malaria, diseases of the eye, the cardiovascular system and the genito-urinary system; and psychiatric illnesses.

Of the 165 persons seen at the outpatient department, 148 (89.7%) were treated and discharged, nine (5.5%) were admitted, seven (4.2%) were treated and asked to come for follow up, while one (0.6%) patient was investigated and asked to return for follow up.

DISCUSSION

District hospitals in Peninsular Malaysia provide primary, ambulatory care to a large proportion of the country's population, particularly those in the rural areas. Ambulatory care, according to Mountz (1975), is the Cinderella stepchild of the hospital system, beginning as a low prestige offshoot in the concern for the horizontal patient. The consequence is that the care provided in the outpatient department is often episodic. However, with the increased utilization of its services recently, the facilities and services provided by the outpatient department have become virtually indispensable to the maintenance of community health. In Malaysia, the impact of the services provided by district hospitals along with the rural health units on the health of the people is reflected in the trends of vital statistics as shown in Table IV.

Despite the existence of medical care services provided by the rural health unit, hospitals, such as the one studied, often have their facilities stretched to cover larger areas than they would under ideal situations (Chen, 1975). Thus it is found that only 54.5% of the respondents live within three miles of the hospital, while the rest come from between three to 50 miles away. In his study of attendances at a child health clinic, Chen (1975) observed that 41% of respondents lived within a distance of three miles, while the rest came from between three to 10 miles away. Undoubtedly, where public transportation is available, the catchment area of the hospital would be considerable as observed in the present study.

The poor and less educated have been found to utilise outpatient services more (Baker, 1966 and Rein, 1969). This is also seen in the present study, as 58.8% of the sample have family income levels below Malaysian \$200 per month. Forty three per cent of the patients have had no education, and of the rest, half have had less than six years of schooling. Richardson (1969), however, observed that though the poor had more disease, they utilised the

Table IV
Vital Statistics, Peninsular Malaysia
1957, 1970 and 1976

	1957	1970	1976
Crude Death Rate (per 100,000 population)	12.4	7.3	6.2
Infant Mortality Rate (per 1,000 live births)	75.5	40.8	30.7
Toddler Mortality Rate (per 1,000 toddlers)	10.7	4.2	2.6
Maternal Mortality Rate (per 1,000 live births)	2.8	1.5	0.8
Life Expectancy (years)			
— Male	55.7	63.5	65.0
— Female	58.1	68.2	69.9

Source: Vital Statistics Peninsular Malaysia, 1976
Department of Statistics, Kuala Lumpur,
Malaysia.

services less.

The predominant age group utilising the out-patient services is the 15 to 44 years group. Findings on this differ in different studies. Among women, Banks (1975) found high consultation rates among the very old and the young who are between 15 to 44 years. Higher utilisation was seen among those above 65 years, followed by under fives, by both Baker (1966) and Morrel (1971). Steinmetz (1971) in his study found that 53% of his sample were in the zero to nine years group. In the present study only a small proportion (5.5%) of children below the age of one came to the hospital. This may be due to their being taken to maternal and child health clinics for immunizations and minor illnesses. The results show a slight male preponderance in the attendance at the hospital. Steinmetz (1971) found that males used the out-patient services less, while Baker (1966) could not establish a difference between the sexes on this. A large proportion (70.3%) of unmarried persons are found in this sample. This is not surprising as 76.4% of the respondents are below the age of 24 years.

In his study of general practice, Morrel (1971) found that 20% of cases presented with respiratory disease, 12% with mental illness, 7.9% with gastrointestinal symptoms, and 6.9% with diseases of the skin and bone. As is common in rural areas, the present study shows that the diseases with which the cases presented most often were respira-

tory diseases (35.2%), gastrointestinal problems (27.3%) and disease of the skin, muscles and bone (21.2%). Among children below 14 years, especially among toddlers aged 1-4 years, respiratory and gastrointestinal diseases were common, while among adults, in addition to these, diseases of the skin, muscles and bone, genito-urinary problems and cardiovascular complaints were common. Fernando and Aponso (1967) found that among toddlers in Ceylon the diseases presented were similar to those found in this study. Giel's study (1968) of outpatient cases in Ethiopia revealed that among children, in addition to respiratory and gastrointestinal diseases, nutritional problems and diseases of the skin were common, while among adults it was diseases of the blood and lymphatic tissues, gastrointestinal tract, respiratory system and genito-urinary system.

It is encouraging to note that parents and grandparents are responsible for 47.2% of the patients coming to the hospital, while another 32.7% patients are self-referred. These observations, coupled with the relative increase in utilisation of government hospital facilities by the Malays (Table V), suggest that there is a possible shift from traditional medicine towards modern medicine among the Malays.

Table V
Changing Patterns of Utilisation of
Government Hospital Facilities

Year	Malays	Chinese	Indians	Others
	%*	%	%	%
1960	25	46	27	2
1965	30	44	25	1
1970	36	39	24	1
1975	41	37	21	1

* Percentage out of total patients utilising government hospital facilities

Source: Economic Report 1976-77, Ministry of Finance,
Malaysia.

One of the problems faced by any hospital is the situation where cases by-pass medical care facilities that are near their homes and come to the hospital for treatment. This appears to be a relatively small problem in this sample. Of those who came to the hospital only 22.9% respondents lived nearer a health facility, such as a sub-centre, *kelinik desa* (rural clinic) or an estate clinic, than the hospital.

It is only to be expected that hospital utilization will go on expanding, with the increasing awareness of the benefits of modern medicine as a result of the spread of literacy. Developing countries have a scarcity of financial resources and of trained manpower, in addition to an excessive fertility pattern and unduly heavy burden of disease (Chen,

1975). It is therefore imperative that health services are organised to maximise returns in terms of the limited resources at hand. Knowing the profile of its patient-population, its service area, and the utilization of its services will enable a hospital to plan its services, allocate personnel and other resources, and monitor costs to achieve maximum use of the limited resources available. Furthermore, information and statistics which could be used for public health education programmes would be available. The fact that families living far away are willing to utilise scanty cash resources as fares to and from the hospital to seek treatment indicates a high level of motivation. Health education given to such motivated groups on general and specific health programmes could possibly meet with great success.

SUMMARY

A sample of 165 new cases attending the outpatient department of a district hospital has been studied. The cases are young and come from relatively poor families which are large. The majority of the cases live near the hospital, but of those who do not, distances travelled and money spent on public transportation to seek medical care are considerable. They are indicative of a high level of motivation among the respondents to seek treatment. Health education programmes directed at such groups are likely to meet with success. Increasing utilization of the outpatient department places a strain on the limited resources available at these centres. The importance of having a knowledge of the profile of the patients the hospital is serving, its service area and the utilization of its services are thus emphasized.

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MEASLES IN PENINSULAR MALAYSIA.

S.T. CHEN

INTRODUCTION

IN many parts of the world especially in developing countries where malnutrition is common, measles is a serious communicable disease of childhood. Measles ranks among the 10 leading causes of death of toddlers in many countries including Chile, Mexico, Panama, Venezuela, Hong Kong, Singapore, and Japan (WHO, 1974). Not only is measles responsible for deaths but it is also responsible for morbidity particularly in its detrimental effect on the nutritional state of the child. In developing countries, it often precipitates protein-calorie malnutrition in childhood (Morley, 1964).

In Malaysia measles is common and endemic (Fig. 1 and Fig. 2). The number of notified cases ranged from 2,798 in 1976 to 3,686 in 1977 (Malaysia 1976 - 1978). However the number of notified cases does not represent the true incidence of the disease since people in Malaysia tend to resort to home treatment or seek traditional medical treatment for measles. Further, even when they seek treatment from "Western trained" medical practitioners, measles may not be notified.

In Malaysia both measles as well as protein-calorie malnutrition are common. On the other hand records indicate that measles caused only 0.5% (5/1001) of the medically certified toddler deaths in 1972 (Malaysia 1977a). However, it has been noted that children often died of complications of measles such as bronchopneumonia which account for 23% of toddler deaths in Malaysia (Chen, 1975). In the Malaysian situation, it is possible that mortality overtly due to pneumonia is associated in some cases with underlying measles.

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Fig. 1.
 No. of notified measles cases,
 Peninsular Malaysia.

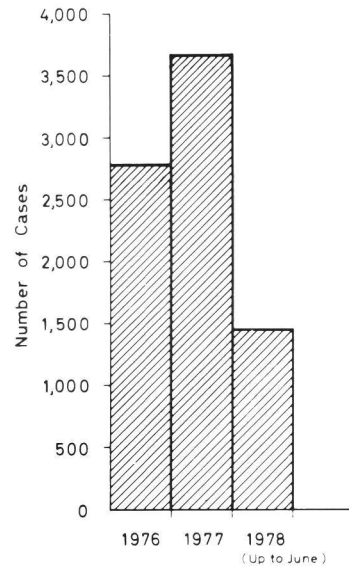


Fig. 1. Notified measles cases, Peninsular Malaysia

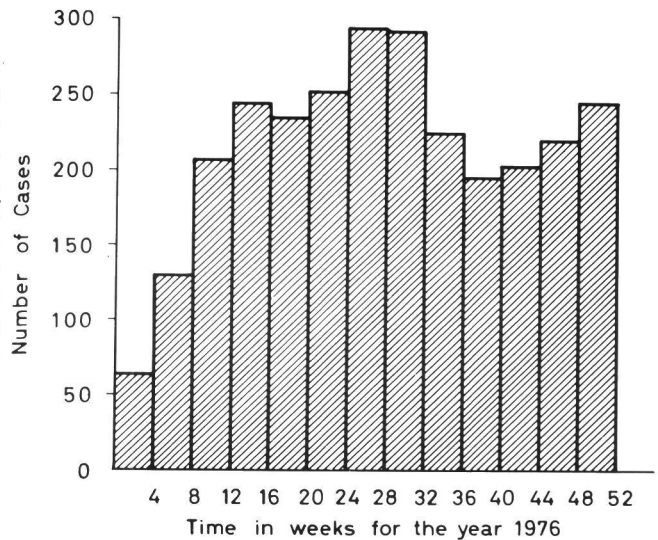


Fig. 2. Notified measles cases by week, Peninsular Malaysia, 1976.

In this paper an attempt is made to examine the incidence and complications of measles as seen in an urban hospital and to examine the effect of measles on growth of a small group of upper income Malay Children followed-up longitudinally from birth to 2 years of age.

MATERIAL AND METHODS

1. Study of hospital records.

There were 863 patients coded as measles of which 200 (23%) were admitted to the University Hospital, Malaysia, from March 1968 to December 1977. Of these, 185 of them were of children up to 12 years of age and admitted to the Paediatric Unit (Fig.3). Children with measles are only admitted to the Paediatric Unit if they are ill with complications such as pneumonia or fits or admitted with high fever of unknown origin. The records of these 185 children were analysed with regards to age, sex, ethnic groups, complications and mortality. Since bronchopneumonia is the commonest complication of measles, the records of a sample of children aged 6 months to 4 years who died of bronchopneumonia during the period of 1968 - 1976 were also studied to see if measles could be the underlying cause of death of some of these children even though death was not certified as being due to measles. Further, the records of all deaths aged 1 month to 12 years in 1972 were studied to locate the number of deaths due to measles.

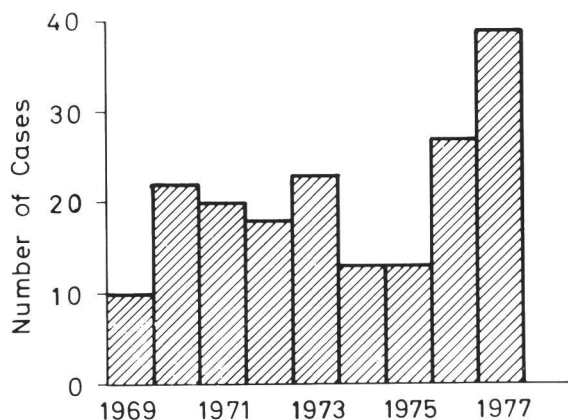


Fig. 3. Measles cases, Paediatric Unit, University Hospital, 1969-1977.

2. Longitudinal Study

A group of 114 upper income Malay children were followed from birth to 1-2 years of age as part of a longitudinal growth and development study from June 1975 to December 1977. Children were immunized with measles vaccine at one year of age. 11 children (10%) developed measles before one year of age. All the children developed measles after the age of 7 months except for one who developed measles at the age of 5 months when her sibling developed measles. One child developed measles at 14 months of age when immunization was delayed due to an upper respiratory infection. This paper examines the complications of measles and the effect of measles on the weight of these children.

RESULTS

1. Hospital Records

a) Incidence.

Measles made up 0.9% (185/20,318) of all Paediatric admissions. Of the 185 children with measles 50 (27%) were Malays, 87 (47%) Chinese and 46 (25%) Indians and 2 (1%) were of other ethnic groups. Compared with the overall admission rates of children of the various groups which was 20%, 49%, 28% and 3% respectively, the Malays had a higher measles admission rate compared with the Chinese and the Indians. This difference is statistically significant ($p < 0.05$). There were 93 males and 92 females.

Fig. 4 shows the age at which measles occurred in children in hospital. It can be seen that only 3% of the children contracted measles at 6 months of age, but 44% by 1 year, 77% by 4 years and 90% by 7 years.

b) Complications.

The rate of complications from measles was 54% (99/185) (Febrile fits which were common were not included as complications). The Malays had a higher rate of complication (70%) compared with the Chinese (46%) and the Indians (52%) and this difference is statistically significant ($p < 0.02$). The most frequent complications were respiratory tract infections (73%) namely bronchopneumonia and bronchitis (65%), otitis media (5%) and empyema (3%)

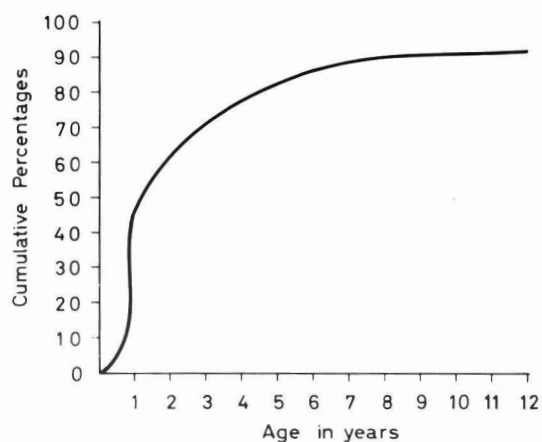


Fig. 4. Cumulative percentages of measles cases by age, Paediatric Unit, University Hospital.

followed by gastroenteritis (14%), encephalitis and meningitis (7%) and septicaemia, conjunctivitis and stomatitis (6%).

The duration of hospital stay ranged from 1 — 38 days with a median of 5 days.

c) Mortality.

The case fatality rate was 3% (5/185). The age of children who died of measles ranged from 6 months to 4 years. In the University Hospital measles caused 1.7% (5/297) of deaths of children aged 6 months to 4 years. However a search through the records of 27 children (aged 6 months to 4 years) who died of bronchopneumonia revealed a further 4 children (15%) whose underlying cause of death was due to measles but not certified as such.

These were 62 deaths of children aged 1 month to 12 years in 1972 and none of which was certified as death from measles. However, a search through the records of these children revealed 2 deaths due to measles, one an 11 month old male infant who died of post measles pericarditis and empyema and the other a 6 year old boy who died of post measles bronchopneumonia. For the same period, 1972, there were only 7 deaths within these age group certified as being due to measles for the whole of Peninsular Malaysia. (Malaysia, 1977a).

2. Longitudinal study

a) Complications.

Of the 12 children, 3 (25%) developed complications and required hospitalization. The complications were bronchopneumonia, bronchopneumonia with empyema and febrile fits.

b) Effect of measles on weight of children.

Except for 2 children who were underweight (72% and 77% of standard weight for age using Boston 50th percentile as standard - International Working Party in Jamaica, 1970) the rest of the children's growth was good (81% to 104% of standard weight) before the onset of measles. As these children were seen at two monthly intervals (except for the 5 month old child who was seen at monthly intervals) minor changes in weight as a result of measles would not be detected. Of the 12 children, 3(25%) had weight loss as a result of measles (compared with the weight taken 2 months earlier), with 2 having post measles bronchopneumonia and one being underweight before the onset of measles. It took 13 months for one (Fig. 5) and 21 months for another to regain the previous weight percentiles, while the third child had not regained her original weight percentile even 15 months after the onset of measles.

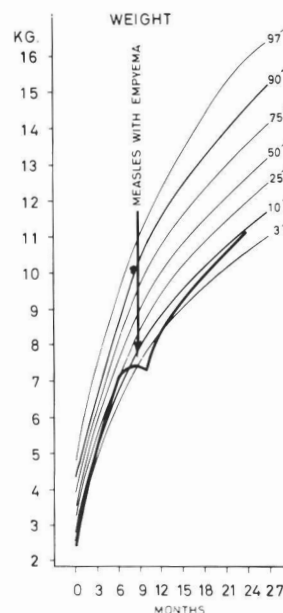


Fig. 5. Weight chart of a child showing the effect of an attack of measles on weight gain.

However, with remaining 9 children, 2 (17%) had definite deviation of weight from a higher to a lower percentile. It took 10 to 19 months to regain the previous weight percentiles. Thus in 42% of the children, measles had an adverse effect on their weight gain and this effect persisted for 10 to 21 months.

DISCUSSION

1. Incidence.

Incidence of measles in Malaysia is not known. The reported cases of about 3,000 cases a year are the tip of the iceberg because many children with measles do not seek treatment from "Western trained" doctors. The Malaysian, people of all ethnic groups, have their own home treatment for measles, ranging from herbs, coconut water, various taboos and spiritual incantations. Many do not seek Western medicine unless the diagnosis is in doubt or when complications set in. Many prefer to see the "Sinsih" or "Bomoh" rather than "Western trained doctors". However a rough estimate of the number of cases seen by "Western trained" medical practitioners can be made from available data. In the University Hospital only 4% of measles cases (35/863) were notified to the health authorities. If it is assumed that the notification rate is 10%, there would be an estimated 30,000 cases of measles seen by medical practitioners each year.

2. Age of onset.

The age at which measles occurred, as seen in the University Hospital, is very similar to that of other developing countries that is with a peak from 6 months to 4 years of age. The high percentage of children (44%) who developed measles before one year of age is probably higher than in the community at large because of higher rates of complications at this age group. The age of onset is earlier compared with developed countries where children are exposed to the disease later in life (Morley 1973). Even among the higher income children (longitudinal study) whose housing conditions are good, 10% of the children developed measles before the age of one year. This means that Malaysian children will have to be immunized with measles vaccine at an earlier age, say at 9 months to one year compared with their American counterparts. The

U.S. Public Health Service Advisory Committee on immunization practices recommends measles immunisation at 15 months of age (CDC, 1976).

3. Mortality.

Although measles is endemic in Malaysia, yet mortality statistics do not indicate that measles is an important cause of death in young children contributing to only 0.5% of toddler death. However a search through hospital records reveals that this is more apparent than real. Death from measles usually results not from the disease itself but from its complications such as bronchopneumonia and encephalitis. By the time children come to hospitals with such complications the rash of measles would often have faded and parents may not volunteer to give the information of the preceding measles infection. Even if the diagnosis of post measles complications is made, doctors often neglect to certify measles as the underlying cause of death as seen in this study where 15% of deaths due to bronchopneumonia were associated with underlying measles which was not noted in the death certificate.

The case fatality rate for measles of 3% is bias, as only severe cases of measles are admitted to the hospital. To get a true picture of the case fatality rate a community survey is indicated. Most of the deaths from measles occur during the first 4 years of life indicating that measles is more severe during the preschool age period. Similar findings have been noted elsewhere in the world eg. England (Miller, 1964), Kenya (O'donova, 1971), Uganda (Bwibo, 1970), Chile (Ristori *et al.*, 1962) and India (Taneja *et al.*, 1962):

4. Morbidity.

The extent of morbidity caused by measles in Malaysia is not known. But measles as seen in Malaysia is probably not as severe as is seen in Africa where a "dark rash" with severe desquamation and sore mouths are frequently seen and measles often precipitates Kwashiorkor (Morley, 1964). This type of measles is seen occasionally in malnourished children in the University Hospital, (Fig. 6). The severity of measles is related to malnutrition (Taneja *et al.*, 1962; Morley, 1964; Bwibo, 1970). However the types of complications seen here are very similar to

those seen in other parts of the world. Respiratory complications are by far the commonest (73%) followed by gastroenteritis (14%), encephalitis and meningitis (7%). The rate of complications in Malaysia is not known but judging from the small sample of higher income children (longitudinal study) where 25% of the children below 14 months of age developed complications, the rate of complications is probably higher in the general population where 40% of the population live below the poverty level. In Denmark the rate of complications of children aged 0—14 years was reported to be 18% (Horwitz *et al.*, 1974) while in Nairobi it was 63% (Hayden, 1974). In U.S.A. the incidence of encephalitis is estimated to be 1 per 1,000 reported cases of measles and measles encephalitis is reported to cause permanent brain damage and mental retardation (CDC, 1976).



Fig. 6. Photograph of a malnourished child with severe measles showing extensive desquamation of skin, stomatitis, and surgical emphysema of neck as a result of bronchopneumonia and pneumomediastinum.

Morley (1964) has pointed out the detrimental effect of measles on African children. In Malaysia, even among the higher income children, the nutritional status of 42% of these children was adversely affected for 10-21 months by an attack of measles.

5. Cost of therapy.

Table I shows the estimated annual cost for in-patient care of measles.

6. Prevention.

Measles is a preventable disease and can be controlled by active immunization which is both safe and effective (Forbes 1973, CDC 1976). However the cost of vaccine is comparatively high (Table II). Nevertheless the cost of therapy for measles approximates that of the cost for the vaccine. Besides in Malaysia where sophisticated medical care such as open heart surgery is available, the prevention of measles must surely be given priority. Measles immunization will not only protect children from the misery, morbidity and mortality of measles, but at the same time a major step will be taken in reducing malnutrition. For the successful control of measles, it is important to maintain a continuing programme of immunization and to establish a successful cold chain system (Hendrickse, 1975). This is best done by incorporating the measles immunization programme into the existing ongoing routine immunization programme for children.

Health education to the public, making them aware of the safety and benefits of measles vaccination, will further contribute to the success of the programme. Health education is very important because of the cultural beliefs and attitudes of the people here regarding measles (Pakshong *et al.*, 1977).

SUMMARY

Although statistics indicate that measles caused only 0.5% of toddler death in Malaysia in 1972, a search through case records of the University Hospital revealed that there was under reporting of measles as an underlying cause of death. 15% of deaths certified as due to pneumonia in children, aged 6 months to 4 years, were the result of underlying measles which was not certified as such. The most common complications were respiratory in na-

Table I**Estimated annual cost of inpatient care for measles**

Estimated no. of measles seen by medical practioners	= 30,000
Porportion of measles cases requiring admission in University Hospital	= 23%
Estimated no. of admissions based on estimate of 10% of all cases of measles	= 3,000
Cost to hospital per patient per day in University Hospital	= \$100/-
Medium duration of hospital stay	= 5 days
Total annual cost of in-patient care for 3,000 measles cases based on a cost of \$75 per day for 5 days	= M\$1,125,000

Table II**Estimated annual cost of measles vaccine**

No. of live birth in Peninsular Malaysia in 1975 (Malaysia 1977b)	= 313,741
No. of infants alive at 1 year based on in fant mortality rate of 33/1,000 live birth	= 303,388
Cost of measles vaccine (when purchase in bulk) per dose	= M\$4/-
Cost of measles vaccine to immunise all infants at one year of age	= M\$1,213,552

ture (73%) followed by gastroenteritis (14%) and encephalitis and meningitis (7%). The rate of complications in the general population is unknown but among a group of higher income children followed longitudinally the rate of complications was 25%. Measles had a deleterious effect on the nutritional status of 42% of these children. To control measles, active immunization should be carried out in Malaysia as part of the routine immunization programme for children. This will not only protect children from the misery, morbidity and mortality of measles, but at the same time it would contribute to the reduction of malnutrition.

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EMPLOYEE HEALTH SERVICES

R. Mahathevan

DEFINITION OF OCCUPATIONAL HEALTH

THE JOINT ILO, WHO Committee on Occupational health as "the highest degree of physical, mental and social well-being of workers in all occupations"

OBJECTIVES OF AN EMPLOYEE HEALTH SERVICE

The International Labour Organization's Recommendation No. 112 (1959) which was endorsed in a recommendation of the European Economic Commission in 1962, and in a resolution of the Committee of Ministers of the Council of Europe in 1972, pointed out that the functions of an employee health service are to protect the workers against any health hazard which may arise out of their work or the conditions in which it is carried out, to contribute towards the workers physical and mental adjustment, in particular by the adaptation of work to the workers and their assignment to jobs for which they are suited, and to contribute to the establishment and maintenance of the highest possible degree of physical and mental well-being of the workers.

THE PRESENT SITUATION IN MALAYSIA

In a recent survey carried out by the Occupational Health Unit of the Ministry of Health (1977) only 25% of the employees and 5% of industries under the SOCSO insurance scheme are covered by some form of occupational health services. In some, curative care with diagnostic and referral system have been developed through the utilisation of hospital assistants and nurses. A few establishments have the services of a part-time medical practitioner who is retained by the firm to provide essentially curative service. Some industrial concerns employ their own physician who provides pre-employment, periodic medical examinations with diagnostic and curative care. It is discouraging to note that none of these establishments, provide any form of health education to workers on occupational hazards,

accidental prevention of monitor the working environment.

However, estates and mines have evolved a more comprehensive medical facility for their workers mainly to satisfy the Rump Labour Code which requires employers to provide free medical health and housing facilities. Most establishments have the services of a visiting medical officer who visits periodically, usually at intervals of a week. He examines all cases referred to him by the resident hospital assistant and, if necessary, refers the more complicated cases to government hospitals. Preventive activity is usually confined to sanitation, antilarval control and immunisation. Provision of family planning and health education though minimal is provided in some estates.

Large establishments provide and maintain hospitals usually individually or as a group to cover estates within a given area. Such hospitals have the services of a full-time resident medical officer supported by a para-medical staff. With fragmentation of estates into small holdings, most group hospitals are finding it increasingly difficult to finance and provide the required comprehensive medical care.

FUNCTION OF AN EMPLOYEE HEALTH SERVICE

A comprehensive employee health service should include health promotion, health education, preventive services, emergency and curative care, rehabilitation, and health maintenance— through further investigation in Occupational Medicine and Hygiene.

Ideally, the provision of these services at the factory level will consist of medical examinations, including pre-employment health interviews and examinations and periodic examinations of workers exposed to hazards, e.g. lead, mercury, silica dusts, etc., examinations of workers whose illness may be a source of risk to other workers and the community e.g. food handlers, crane drivers and the examination of workers returning to work after illness or injury to determine their fitness. Medical care should also include initial treatment in emergencies, e.g. accidents, heart attacks, cerebro-vascular accidents, follow-up treatment of all industrial diseases and general illness.

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Table I: RECOMMENDED MEDICAL STAFFING IN AN EMPLOYEE HEALTH SERVICE

No. of employee	Staff nursing services		Staff physician services
	No. of hrs. per week	No. of nurses (40 hrs. per week)	No. of hrs. per week
200	12	1 part-time	3 hours
300	18	1 part-time	4 hours
400	24	1 part-time	5 hours
500	30	1 part-time	6 hours
1,000	60	1 full-time and 1 part-time	11 hours
2,000	120	3 full-time	21 hours

This should include supervision of nursing and first aid services, health education with counselling and the rehabilitation and resettlement of injured workers. Services at the factory level should also include protection against actual or potential harmful conditions and its prevention. This may be achieved by the investigation of industrial diseases, the measurement, assessment and control of adverse factors in the working environment (industrial hygiene). Advice may also be given to management in relation to their obligations on medical matters under the factory laws, medical aspects of safety precautions like effects of fatigue, poor eyesight and health risks of new processes or materials. The service should also provide supervision of facilities like canteens, rest rooms and rodent control.

MANPOWER REQUIREMENTS

In Malaysia it is recommended that the population ratio be one doctor for every 4,000 workers. This doctor would be able to render both medical and preventive services to the above working population. He should be assisted by 2-6 industrial nurses (depending on the number of work shifts). A safety engineer, possibly with some training in industrial hygiene should be a member of the occupational health team. However, a health inspector with some training in industrial hygiene and safety could be a suitable substitute in the absence of a safety engineer. In addition, the team should consist of supporting staff like receptionist, typist, clerk etc.

The American Medical Association's Council on Occupational Health and the National Institute of Occupational Safety and Health (NIOSH) have recommended that to provide a *minimum* employee health service, there should be 2 hours of physician's services per week for the first 100 workers and 1 physician hour for each additional 100 workers, and 6 hours of nursing coverage per week for every 100 workers. Table I gives the recommended medical staffing in an employee Health Service depending on the number of employees. However, this can be modified depending upon medical manpower availability.

To provide a comprehensive employee health service the nursing coverage may be increased depending on an individual company's health needs. These needs may be evaluated taking into consideration the size of the industry, industrial process and the products manufactured. Consideration should also be taken into account of the continuous processing which requires services 24 hours, 7 days a week or eight hours daily, and if the industry is hazardous, the nature of the hazards, the frequency of accidents and whether the industry is in a developed or developing area from the point of view of the availability and accessibility to other Government and private medical services.

ADVANTAGES OF AN EMPLOYEE HEALTH SERVICE ADVANTAGES TO THE EMPLOYER

Production is influenced by the health status, and safety consciousness of a company. Obvious-

ly healthy workers who are well adapted to their jobs are able to function better and achieve optimal production. Offering curative service for accidents and illnesses at work enable the workers to save valuable working time usually lost visiting medical clinics outside the industry. Medical personnel (doctor/nurse) attached to industry will be in a better position to advice the employers and employees on matters of occupational health and safety as compared to 'panel doctors' who usually have little or no knowledge of the working environment. An employee health service will reduce the rate of sickness absence if illnesses arising from work can be prevented or immediately attended to. A well equipped and competent employee health service will result in satisfied, well adjusted and highly motivated workers. This will reduce absenteeism and minimise labour turnover. It will also be effective in the prevention of accidents and occupational diseases, thus indirectly reducing the quantum of compensation paid by social security and through workmen's compensation.

ADVANTAGES TO THE EMPLOYEE

The employee who suffers from acute illness or is injured in an accident will receive prompt medical attention. The doctor will be aware of the industrial processes and be familiar with the working environment which will contribute towards early detection and prompt treatment of the workers. It can also foster better cooperation and participation of management in matters of occupational health and safety. Finally, the employee health service will work actively in the identification and elimination of occupational hazards at work.

ADVANTAGES TO THE DOCTORS

The doctor will be able to observe the individual patient's (worker) health problems in a much broader context than would otherwise be possible. He will be able to identify and prevent causes of accidents and ill health connected with work and the working environment. This will make his work more meaningful and professionally satisfying. Finally, the doctor will be able to specialise in occupational medicine and further improve his career prospects.

WHO SHOULD PROVIDE THE EMPLOYEE HEALTH SERVICE?

Optimal health of an employee will increase productivity, contribute towards industrial harmony and will eventually benefit management in particular and the nation in general. Thus, it is in the interest of industrial organisations

to undertake the responsibility of developing an excellent health service for its workers.

Multinationals and large plantation agencies have established their own comprehensive medical services, while others have minimal services which could be further developed. It is the medium and small industries which experience difficulties in the provision of medical service for its workers. It would be advantageous if several companies jointly organise a medical service thereby reducing capital cost, and share recurrent expenditure. Contributing industries would in this way get medical services at a much reduced cost. Moreover scarce medical manpower will be strategically deployed and utilised.

THE ORGANISATION OF OCCUPATIONAL HEALTH SERVICES

The development of Occupational Health Services in Malaysia will eventually be administered in a two tier system.

First Tier Strategy-Establishment of occupational health centres to provide occupational health services.

At the first tier level the services will include the diagnosis and control of occupational diseases including treatment and rehabilitation. Supervision of occupational health services in manufacturing industries, estates, mines, hospitals, laboratories, shops and offices including the provision of specialized occupational health services such as monitoring of workers in hazardous industries. Occupational toxicology and occupational hazards advisory services to the public sector and government agencies such as the Factories and Machinery Department, assistance to the Social Security Organisation in the diagnosis and assessment of occupational diseases and injuries. Research in occupational health and training of health personnel from industrial areas, and finally health education of workers, employers and the community.

Second Tier Strategy — Planning and administrative development of occupational health activities in Malaysia.

The second tier of services will provide co-ordination of occupational health activities in Peninsular Malaysia with Sabah and Sarawak. the collection, analysis and evaluation of occupational health statistics and epidemiological data on industrial diseases. Further development and implementation of occupational health activities in Malaysia, including supervision and administration of occupational health centres, co-ordination with general medical and health services to promote occupational health. To re-

view and enforce occupational health legislation, the co-ordination and active teaching of the discipline of occupational medicine in all medical and para medical institutions. Provide consultant and advisory services in industrial toxicology, and liaison with international agencies such as WHO, ILO, IRPTC and other regional agencies for the promotion of occupational health.

However, the above activities will be carried out at two functional levels mainly the National Occupational Health Centre in Kuala Lumpur and the regional centres in Penang, Johore Bahru and eventually in Kuantan. The National Occupational Health Centre has already been planned and is sited in the Public Health Institute Complex.

SUMMARY

This publication is the first in what is planned to be a regular information service to industry and occupational health professionals in Malaysia. The objectives of the service are to offer regular information about occupational health in general and about specific occupational health hazards. The aim would be to keep the occupational health professionals and industry abreast with

important and current developments in occupational health in Malaysia and other advanced countries.

The first publication is primarily directed to general practitioners providing medical care in industry and management in general. It starts out with the definition of occupational health, the objectives of an employee health service and describes the present situation in Malaysia. The advantages of a worker's health programme is also discussed. Finally a brief outline of the future organisation of occupational health in Malaysia is presented.

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BIOPSY TECHNIQUES IN THE DIAGNOSIS AND TREATMENT OF MOUTH DISEASES AND TUMOURS

K. RAMANATHAN

BIOPSY is the removal of tissue from a living patient for microscopic examination and diagnosis. Professor Ruge in 1879 is credited with the introduction of the biopsy. The biopsy is our most accurate and reliable check on our clinical diagnosis. It is our greatest aid to diagnosis.

INDICATIONS

The aim of doing a biopsy is to establish an accurate diagnosis as early as possible in order that correct treatment may be initiated with the least possible delay. A biopsy is indicated whenever a careful clinical examination along with the history fails to lead to a correct diagnosis. Any ulcer, excluding well-known entities such as periadenitis mucosa necrotica recurrens (PMNR), which with treatment does not show evidence of healing in one week should be subjected to microscopic examination. All oral precancerous conditions should be submitted to histopathological studies to determine the premalignancy index scores. A biopsy should be carried out on any growth or swelling suspected of being a neoplasm. In cases of patients with oral squamous cell carcinoma a biopsy should be done not only to confirm the clinical diagnosis but also to assess the histological features which influence the prognosis. Any tissue surgically excised or any tissue spontaneously expelled from a body orifice should be examined under the microscope. It is also desirable to do a microscopic examination of material from a persistent draining sinus, the source of which cannot be readily identified, and along with some of the lining of the sinus. A biopsy should be done on any intraosseous jaw lesion which cannot be positively diagnosed by radiographs. A biopsy is indicated when lesions fail to respond to recognized therapy within a reasonable period of time or when there is doubt about the clinical diagnosis.

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TYPES OF BIOPSY

Incisional biopsy is the removal of a portion of the lesion along with some normal tissue for identification. It is best to remove the tissue as a small wedge of pyramid with the point in the connective tissue and the triangular base at the surface. Incisional biopsy is contraindicated in cases of suspected haemangioma. *Excisional biopsy* is the complete removal of the lesion in question by circumscribing it in such a way that it is totally excised. *Aspiration biopsy* is done by inserting a large-gauge needle into the softer or semifluid in consistency areas of a mass. Strong negative pressure is created which draws fluid and cells into the needle. This technique as a preliminary procedure to exclude intraosseous haemangiomas is mandatory. Aspiration and examination of fluid contents in cases of odontogenic cysts are also useful. A soluble protein level of below 4.8 gm per 100 ml of cystic fluid is strong evidence that the lesion is a primordial cyst. Further-more microscopic examination of aspirate consisting of cheesy-like material in primordial cysts will demonstrate the presence of parakeratin or keratin cells.

In skilled hands, *needle biopsy* of bone tumours has a definite use, particularly in cases where the site of the lesion, or the treatment to be adopted make open biopsy difficult or undesirable. Material can be obtained for imprint preparations, paraffin sections of for histochemical studies. Specimens for biopsy can be obtained from the mouth by the use of a suitably modified Ellis *biopsy drill*, which fits into a straight dental handpiece. This instrument can be used to obtain specimens 1.2 cm long and 0.14 cm in diameter. It is particularly useful for obtaining biopsy material from central fibroosseous lesions in the jaws, being easy, safe, and suitable for use under local anaesthesia on out-patients. However, the specimen obtained may be so small that it may not be truly representative, whilst the heat which may be generated during the procedure, unless great care is exercised, may cause distortion. A negative drill biopsy must never be accepted, for it is very easy to miss the lesion when inserting the drill.

Curetage is the removal of small bits of tissue

with a sharp instrument. Curettement is used to remove tissue from a bony cavity such as a dental socket, a sinus tract, or a body space such as the maxillary antrum. *Tissue imprints* provide an excellent means of studying the cells of tumours of the lymphoreticular system. Imprints are made of the tissue biopsy by gently touching the freshly cut surface on clean glass slides. The imprints may then be air dried, fixed in methyl alcohol and stained with one of the standard haematological Romanovsky methods. Not all lymphomas give equally satisfactory preparations by this technique. If the tumour has an abundant reticulin or fibrous tissue stroma, few cells may come off onto the imprint, or they may be distorted or disrupted. Most lymphomas, however, give satisfactory preparations and the cells of Burkitt's lymphoma biopsies usually separate easily from each other, making excellent imprint preparations.

Exfoliative cytologic smears have been useful in the diagnosis of lesions of herpes simplex infection, herpes zoster, pemphigus vulgaris, benign familial pemphigus, keratosis follicularis, hereditary benign intraepithelial dyskeratosis, white sponge nevus and pernicious and sickle cell anaemias. *Tissue smears* from the mouth and stained with periodic acid Schiff (PAS) will readily help in the diagnosis of oral candidosis. *Frozen sections* are seldom used for oral diagnosis, but where histochemical methods are envisaged, sections of unfixed tissue cut in a cryostat may be required.

BASIC PRINCIPLES

The scalpel is the instrument of choice, since it cleanly removes the tissue and does not dehydrate it as the cautery or the high-frequency cutting knife may. This latter instrument is of great value, however, in dealing with vascular lesions, where it controls bleeding at the biopsy site. Always use a sharp scalpel to avoid tearing tissue. Do not paint the surface of the area to be biopsied with gentian violet, iodine or a highly coloured antiseptic. Infact, there is no need to apply antiseptics prior to biopsy. If using infiltration anaesthesia do not inject anaesthetic solution directly into the lesion as this procedure tends to distort the tissue. It would be best to inject around the periphery of the lesion.

It is desirable to take an adequate amount of tissue from the most clinically suspicious areas to help in the prompt histopathological diagnosis. The site for biopsy should be chosen with care otherwise the percentage of value one obtains from the histopathological diagnosis will decrease accordingly. Moreover one must select a site that has not been subjected to trauma or

to irritation from previous treatment. In the majority of cases the margin of the normal and abnormal is suitable for it helps in the orientation of the specimen and avoids necrotic areas in the centre. Also the pathologist must assess microscopically the manner in which the disease process interacts with the surrounding tissue with respect to such features as invasiveness, encapsulation, and the like, thus necessitating a small border of normal tissue. If the lesion is small it would be better to do an excision biopsy by removing it along with a margin of normal tissue. No good purpose is served by submitting a patient to two operations if one will suffice.

An adequate amount of tissue must be removed for purposes of biopsy. It must always be remembered that excised tissue shrinks and the excised specimen should be at least $1.0 \times 0.5 \times 0.5$ cm. in size. Biopsies that appear to give large specimens in the mouth often produce disappointingly small specimens in the bottle of 10% formal saline and even smaller sections on the slide. Thin, deep wedge sections taken from the substance of the lesion across the border into the normal tissue are more desirable than large shallow specimens taken from the surface. Surface specimens often provide only necrotic tissue or crust and do not represent the deeper, more typical character of a lesion. Moreover the frequency of infection in oral lesions often lead to difficulties in interpretation. Removal of bits of necrotic tissue or the cutting of superficial specimens usually results in a negative or an inconclusive pathology report.

Biopsy specimens should not be ruined by being crushed by the use of toothed forceps or haemostats. This complication can be avoided by transfixing the lesion with one or more sutures, which can then be used to move and control the specimen and to tense the soft tissues during its removal. When forceps are used to grasp the specimen be careful not to mutilate it. Similarly, the use of electrocautery to take a biopsy is usually contraindicated as it is deleterious to the interpretation of the biopsied tissue. Although it is desirable for surgery because it aids haemostasis, the effect of the cautery is to boil tissue fluid and precipitate protein. Microscopically, such tissue shows a coagulated and torn appearance and makes histologic evaluation impossible in the cauterized areas. Fix the tissue immediately upon removal in 10% formal saline. If the specimen is thin, place it upon a piece of blotting paper and drop it into the fixative. This will prevent curling of tissue. If the suspected malignant tumour is related to bone care should be taken not to penetrate the periosteum when a biopsy specimen is removed. When a

biopsy specimen is being taken from the buccal mucosa in cases of suspected lichen planus, sites other than the occlusal line must be used. Frictional keratosis is often found in this area and it may modify the microscopic picture.

In speckled leukoplakias it is better to take the biopsy from the atrophic red areas which are more ominous. Since a prickle cell can either form keratin or divide and it cannot do both at the same time the part which is likely to show the most advanced premalignant change is any area that resembles granulation tissue or red atrophic areas. Small patches are better removed in their entirety. A high percentage of speckled leukoplakias have a superimposed candidial infection. It is best to treat the candidosis before surgical excision for with such treatment the speckled leukoplakias often shrink in size thus reducing in size the area to be excised. In multiple or large leukoplakias or erythroplakias biopsies should be taken from several places because they may show varying premalignancy index scores (PMI scores). Erythroplakias very often on microscopic examination prove to be carcinoma-in-situ. A biopsy specimen must be taken from the most highly suspicious site and should be sufficiently deep enough. Oral tissue biopsies for diagnosing leukaemias are useless and only add to the patient's distress. Generally speaking, when a choice exists, areas to be avoided are those nearest to bone, cartilage or teeth, near large blood vessels, where the tumour bed is shallowest and sites of necrosis.

DISCUSSION

All excised surgical specimens should be sent for pathological examination, even when the doctor is certain that his clinical diagnosis is correct and that the lesion is benign. In the vast majority of instances the histological examination merely serves to confirm the clinical diagnosis but even experienced clinicians are occasionally surprised by the findings of the pathologist. The omission of this essential procedure could result in the patient's life being jeopardized. Furthermore, it is a valuable self-teaching diagnostic aid. The repeated microscopic verification or correction of clinical impressions improve diagnostic acumen. A positive biopsy report is the only acceptable diagnosis of malignant tumours and this is important when the clinician has to tell either the patient or his relatives the nature of the condition. It is also essential for the purposes of treatment, records and research. A histological diagnosis forms a permanent record and is invaluable on those occasions when it becomes necessary to confirm that an excised lesion was benign. Thus a patient who is found to have a

cancer may give a history of having had a tumour removed say from the tongue some time before. It will then become important to determine whether the malignant tumour is either a primary growth, a recurrence or a metastatic deposit related to the earlier tongue tumour, before the prognosis of patient can be assessed or a treatment plan prepared. In malignant tumours for example squamous cell carcinoma the histological appearances of the lesion may be of great importance in determining the prognosis of the patient and may provide some indications of the likely response of the tumour to radiotherapy. The histopathology examination will also tell whether the entire cancer has been removed or whether additional surgery is required.

On the rare occasions upon which the histological diagnosis and the clinical diagnosis do not agree, a full discussion between the surgeon and the oral pathologist will usually either resolve the problem or indicate further investigations which may clarify the picture. Ideally the oral pathologist should form part of the team for the management of tumours so that his expertise can be utilised to determine the site and extent of biopsy. When a lesion appears to be malignant on clinical grounds but the biopsy fails to confirm the suspicions of the surgeon, it means only that there are no features to suggest the expected diagnosis in that particular piece of tissue which was removed at that particular time. A repeat biopsy should always be performed when there is any doubt about the adequacy or representative nature of the original specimen. It is worth bearing in mind that the clinician is able to study the patient first hand and must always maintain a high index of cancer suspicion. Whereas the pathologist must depend on the clinical data submitted by the surgeon and diagnose only what he sees on a microscopic slide. He cannot diagnose the cancer that is left behind on the patient.

The diagnosis of bony lesions should be established by a combination of clinical, radiological and pathological investigation, supplemented when necessary by biochemical and haematological studies. The levels of calcium, phosphorus, alkaline phosphatase, and acid phosphatase in the serum are important in some conditions e.g. hyperparathyroidism, Paget's disease, metastatic carcinoma and myeloma. Plasma and urinary proteins, urinary catecholamines, and bone marrow cytology are important in myeloma and metastatic neuroblastoma respectively, and haematological investigation is essential in malignant lymphomas and leukaemic involvement of bone. Radiological investigation is always of the utmost importance, and it must be emphasized that the

relevant radiological information should always be available to the pathologist when he is asked to make a histological diagnosis of a bony lesion. Open surgical biopsy is the technique usually adopted. A generous sample of tissue, preferably from the growing margin of the tumour, should be obtained, care being taken to obtain a representative sample of the lesion and to avoid restricting the specimen to necrotic tissue or to reactive tissue outside the margin of the tumour.

SUMMARY

The biopsy is the most accurate and reliable

check on one's clinical diagnosis. It is the greatest aid to oral diagnosis. The indications for oral biopsy, types of biopsy techniques applicable to diagnosis and treatment of oral diseases and tumours and principles that will enhance the value of a biopsy and make it meaningful to the doctor and patient are emphasized.

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AN EPIDEMIOLOGICAL STUDY OF CANCERS IN THE UNIVERSITY HOSPITAL: A PRELIMINARY REPORT

LIM HENG HUAT

INTRODUCTION

IN RECENT YEARS, cancers or malignant neoplasms have emerged as the second leading cause of death (among the medically certified and inspected deaths) in West Malaysia, accounting for 8.9% of these certified deaths in 1976. A decade ago in 1966, the corresponding figure was only 6.7%. These figures are likely to be under-estimations of the true picture as only about 30% of all deaths in West Malaysia are medically certified (Malaysia, 1968 & 1978). Over the 10-year period, from 1966 to 1976, the death rate due to cancer for Peninsula Malaysia rose from 16.4 per 100,000 population to 20.3 per 100,000 population (Malaysia, 1968 & 1978). These rates are again likely to be under-estimations.

In contrast to the emerging importance of cancers as a major health problem, there is still a great lack of documented, large-scale epidemiological studies to describe cancer patterns and frequency in the country. Up to date, cancer research in Malaysia has been mainly centred on clinical studies which focused attention on selected cancers of interest to clinicians in their respective practises (Bahari *et al.*, 1976; Ramanathan, 1973; Silva, 1978; Sinnathuray, 1971; Sivanesaratnam and Ang, 1976), or biopsy series which are understandably biased in favour of sites more accessible to biopsy (Ahluwalia *et al.*, 1966; Kutty *et al.*, 1972). Hospital records can also provide a useful impression of the pattern and frequency of cancer in a population but again constitute biased samples with various limitations.

Ideally, the setting-up of a national cancer registration system, to document all cancer cases occurring in the country, would make possible the carrying out of comprehensive, nation-wide epidemiological studies. Until such time when complete registration of all cancer cases is possible, however, all these various studies — clinical,

biopsy, hospital records, etc., are necessary to provide a general impression of cancer epidemiology in the country.

METHODOLOGY

The material for this study comprises of about 2000 cancer cases discharged from the University Hospital, Kuala Lumpur, during a 3-year period, from 1972 to 1974. Compilation of data is currently still in progress. This preliminary report is based on an analysis of data for 1973. There were a total of 664 cancer cases discharged from the University Hospital in 1973. Readmissions during the year were programmed by computer to be excluded from the analysis: each case therefore being counted only once. The age, sex and ethnic group distribution of the various types of cancer (using the International Classification of Diseases, W.H.O., 8th Revision, 1965), were analysed. Case records were also examined to determine the basis of diagnosis for each of the cancer cases. The total number of cases discharged from the University Hospital, 1973 (for all diagnoses, including cancers) were also analysed to provide a baseline impression of the hospital intake population. Readmissions were again similarly excluded.

RESULTS

The total number of patients discharged from the University Hospital during 1973 (for all diagnoses, including cancers) was 13,264. Table I shows the age, sex and ethnic group distribution. 51.2% were males, 48.8% were females. The majority of the patients were Chinese (50.1%), followed by Indians (30.0%), Malays (16.8%), Orang Asli (1.1%) and Others (2.0%). This reflects the greater utilization of the University Hospital by Chinese patients during 1973, and subsequent findings have to be interpreted in this light.

The number of cancer patients during the same period was 644, constituting 4.9% of the total 13,264 patients. The age, sex and ethnic group distribution of the 644 cases is shown in Table II. 55.0% were males compared to 45.0% females. The highest frequency of cancers occurred among the Chinese (69.7%). The percentage distribution of these cancer cases is compared

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TABLE I
DISTRIBUTION OF PATIENTS (ALL DIAGNOSES) BY AGE, SEX AND ETHNIC GROUP,
UNIVERSITY HOSPITAL, 1973

Age Group (years)	Malay		Chinese		Indian*		Orang Asli		Others		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Below 1	167	145	382	243	226	214	9	12	10	8	794	622
1 - 4	89	59	184	127	126	97	8	4	6	3	413	290
5 - 14	108	67	324	210	201	132	16	5	9	12	658	426
15 - 24	349	298	676	624	338	336	5	16	20	24	1388	1298
25 - 34	218	247	449	843	266	464	11	8	22	41	966	1603
35 - 44	105	84	302	411	206	269	12	19	14	25	639	808
45 - 54	74	56	238	353	251	152	9	3	17	15	589	579
55 - 64	60	31	368	318	288	114	1	3	11	8	728	474
65+	40	29	321	270	230	71	5	2	14	7	610	379
Total	1210	1016	3244	3399	2132	1849	76	72	123	143	6785	6479

TABLE II
DISTRIBUTION OF ALL CANCER PATIENTS BY AGE, SEX, AND ETHNIC GROUP,
UNIVERSITY HOSPITAL, 1973

Age Group (years)	Malay		Chinese		Indian*		Orang Asli		Others		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
Below 1	0	1	0	0	1	0	0	0	0	0	1	1
1 - 4	0	1	9	3	2	1	1	0	0	0	12	5
5 - 14	1	0	9	1	0	2	0	0	0	1	10	4
15 - 24	4	4	11	14	2	2	0	0	0	0	17	20
25 - 34	5	5	18	21	1	4	2	0	0	0	26	30
35 - 44	2	3	26	35	8	5	3	0	0	0	39	43
45 - 54	7	4	28	40	15	12	3	1	0	0	53	57
55 - 64	8	6	62	55	25	10	0	2	0	0	95	73
65+	6	3	73	44	20	8	0	1	2	1	101	57
Total	33	27	235	213	74	44	9	4	2	2	354	290

TABLE III

PERCENTAGE DISTRIBUTION OF ALL CANCER PATIENTS BY ETHNIC GROUP, COMPARED WITH TOTAL UNIVERSITY HOSPITAL PATIENTS, 1973

Ethnic Group	Total University Hospital Patients		All Cancer Patients	
	Number	Percentage (%)	Number	Percentage (%)
Malay	2226	16.8	60	9.3
Chinese	6643	50.1	449	69.7
Indian	3981	30.0	118	18.3
Orang Asli	148	1.1	13	2.0
Others	266	2.0	4	0.6
Total	13264	100.0	644	100.0

TABLE IV

TEN MOST COMMON CANCERS UNIVERSITY HOSPITAL 1973

Male			Female		
Site (ICD 8th Revision)	Number of cases		Site (ICD 8th Revision)	Number of cases	
155 Liver	51		180 Cervix	55	
151 Stomach	45		174 Breast	32	
162 Lung	42		151 Stomach	20	
204-7 Leukaemia	21		162 Lung	18	
147 Nasopharynx	20		183 Ovary	18	
154 Rectum	17		155 Liver	14	
150 Oesophagus	15		153 Colon	12	
172-3 Skin (including melanoma)	15		204-7 Leukaemia	12	
153 Colon	14		172-3 Skin (including melanoma)	12	
161 Larynx	14		150 Oesophagus	11	
140-209 All Sites	354		140-209 All Sites	290	

with that of the total hospital patients in Table III. The high percentage of Chinese cancer patients is probably due in part to their greater utilization of the University Hospital, but there is a suggestion of relative Chinese predominance in the types of cancers seen in the hospital in 1973. However, further analytical studies in greater depth would have to be carried out to validate these findings.

TABLE V

FIVE MOST COMMON CANCERS IN CHINESE PATIENTS, UNIVERSITY HOSPITAL, 1973

Male			Female		
Site (ICD 8th Revision)	Number of cases		Site (ICD 8th Revision)	Number of cases	
155 Liver	39		180 Cervix	38	
162 Lung	33		174 Breast	26	
151 Stomach	31		162 Lung	17	
147 Nasopharynx	15		151 Stomach	16	
204-7 Leukaemia	13		183 Ovary	14	
140-209 All Sites	236		140-209 All Sites	213	

Cancer patterns

The ten most common cancers in this series are listed in Table IV. Among males, carcinoma of the liver was the most common cancer, accounting for 14.4% of all cancers in male patients, followed by carcinoma of the stomach (12.7%) and lung (11.9%). The other common sites were blood (leukaemias), nasopharynx, rectum, oesophagus, skin, colon and larynx. Among females, carcinoma of the cervix was the predominant cancer (19.0% of all cancers in female patients). (N.B. This excludes carcinoma-in-situ of the cervix) Breast cancer accounted for 11.0%, stomach (6.9%), lung and ovary (each 6.2%). Other common sites were liver, colon, blood (leukaemias), skin and oesophagus, (Table IV).

Analysis of the results by ethnic group showed that the 5 leading cancers among Chinese males were liver (16.5%, of all cancers among Chinese males), lung (14.0%), stomach (13.1%), nasopharynx (6.4%) and leukaemias (5.5%), (Table V). Carcinoma of the cervix was the leading cancer among Chinese females (17.8% of all cancers among Chinese females), the other 4 leading sites being breast (12.2%), lung (8.0%), stomach (7.5%) and ovary (6.6%), (Table V). For the other ethnic groups, the number of cases in 1973 was too small for any meaningful analysis in this preliminary report. Additional data, currently being compiled for the 3-year period (1972 to 1974) should yield sufficient material for further analysis.

The racial distribution of the more common cancer sites in this series is shown in Table VI. As noted earlier, for all cancer sites, the Chinese had the highest frequency compared to the other races. When these individual cancers (of the

TABLE VI
DISTRIBUTION OF SELECTED CANCER SITES BY ETHNIC GROUP,
UNIVERSITY HOSPITAL, 1973

Site (ICD 8th Revision)		Number of cases					Total
		Malay	Chinese	Indian	Orang Asli	Others	
151	Stomach	1	47	16	1	0	65
155	Liver	9	49	6	1	0	65
162	Lung	6	50	4	0	0	60
174	Breast	0	26	7	0	0	33
180	Cervix	7	38	9	1	0	55
204-7	Leukaemia	2	21	8	1	1	33
140-209	All Sites	60	449	118	13	4	644

stomach, liver, lung, breast, cervix and leukaemias) were analysed by racial distribution, the highest percentages were again found in the Chinese (varying from 63.7% for leukaemias to 83.3% for lung cancer).

The age distribution of patients for the more common cancers in the series is shown in Table VII. There was a greater frequency of carcinoma of the stomach, liver, lung, breast and cervix in the older groups. The modal class (with the highest frequency) was the (55-64) years age group for carcinoma of the stomach, liver and breast; (65 and above) years age group for carcinoma of the lung, and (45-54) years age group for carcinoma of the cervix. For leukaemias, the younger age groups show the highest frequency, the modal class being (5-14) years.

DISCUSSION

It must be borne in mind that the data presented here are based on hospital records, which are, as pointed out earlier, biased samples of the population. Hospital samples represent only a selective proportion of the actual population at any one time period. There is a selective bias

in the hospital utilization and intake of cases, depending on 3 basic factors. The first factor constitutes the local population, and its attitude towards hospitalization, which may be culturally influenced. Secondly, the hospital facilities (for diagnosis and treatment), bed capacities, reputation and policies on admission may also affect the hospital intake. Finally, the available specialist staff and their fields of interest, may influence types of cases admitted.

The reliability of the data may also be affected by problems such as missing/misplaced records, erroneous diagnosis, and errors incurred during any of the stages from initial data recording to final processing. However, bearing these limitations in mind, hospital records can still provide useful impressions of the pattern and frequency of cancer in a local population.

Table VIII shows the basis of diagnosis for the 644 cancer cases in 1973. A high percentage of these cases (81%) was diagnosed by autopsy, biopsy, haematology or cytology. Another 9% of cases was diagnosed by exploratory operation or radiology (including radioactive isotope scans). Only 5.9% of cases was diagnosed "clinically",

TABLE VII
AGE DISTRIBUTION OF PATIENTS BY SELECTED CANCER SITES,
UNIVERSITY HOSPITAL, 1973

Site (ICD 8th Revision)	Number of cases in each age-group (years)									
	Below 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	Total
151 Stomach	0	0	0	0	1	8	8	26	22	65
155 Liver	0	0	1	1	7	7	13	19	17	65
162 Lung	0	0	0	0	2	3	7	21	27	60
174 Breast	0	0	0	2	5	6	4	9	7	33
180 Cervix	0	0	0	1	6	11	21	8	8	55
204-7 Leukaemia	2	6	9	5	5	2	2	1	1	33
140-209 All Sites	2	17	14	37	56	82	110	168	158	644

without any form of investigation. This is a factor in favour of data reliability, in the sense that a great proportion of these cancer cases were diagnosed by methods which were presumably highly accurate and precise.

A few general impressions can be elicited from this preliminary study. Firstly, there seems to be a higher frequency of cancers in the Chinese (in excess of that expected from the utilization rate of the hospital). The significance of this needs to be further investigated. Secondly, the most common cancers among males seen in this series were from the gastro-intestinal tract (stomach, liver) and the respiratory tract (lung). This is especially so among the Chinese. For the other races, the numbers involved at this stage are too small to describe cancer patterns. Among the females, cancer of the cervix and breast were the predominant cancers. Further comparisons with experiences in other neighbouring countries, especially Singapore (Shanmugaratnam, 1973), are deemed premature at this stage. It is hoped that some useful comparisons can be done with subsequent analysis.

SUMMARY

A descriptive study of approximately 2000 cancer cases discharged from the University Hospital, Kuala Lumpur, during the 3-year period from 1972 to 1974, was carried out to analyse cancer patterns and frequency in the various age, sex and ethnic groups. This preliminary report is based on an analysis of data for 1973. There was a total of 644 cancer cases discharged during 1973, constituting 4.9% of the

TABLE VIII
BASIS OF DIAGNOSIS OF CANCER CASES
UNIVERSITY HOSPITAL
1973

Basis of Diagnosis	Number of cases	Percentage
Autopsy	29	4.5
Biopsy	450	69.9
Haematology	31	4.8
Cytology	11	1.7
Exploratory Operation and Radiology	58	9.0
Clinical	38	5.9
Unknown*	27	4.2
Total	644	100.0

total hospital patients (for all diagnoses). The highest frequency of cancers occurred among the Chinese (69.7%), in excess of that expected from their utilization rate of the hospital (50.1%). The 5 most common cancers in males were liver, stomach, lung, leukaemia and nasopharynx. In the females, the 5 leading cancers were cervix, breast, stomach, lung and ovary. This is the pattern reflected among the Chinese; for the other races, the numbers involved at this stage were too small for analysis. The age distribution

of the patients in this study showed that cancers of the stomach, liver, lung, breast and cervix predominate in the older age groups (45 years and above), while leukaemia was more common among the younger age groups.

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PSYCHIATRIC PRESENTATION OF THALAMIC TUMOUR A CASE REPORT

Tan Chee Khuan Deva Dass Hammidah Majeed

INTRODUCTION

PSYCHIATRIC SYMPTOMS frequently are the initial, and occasionally the only symptoms of intracranial tumour. (Mulder and Swenson, 1974). Such symptoms may precede by days or even months, the more obvious motor or sensory symptoms and findings of brain tumour. The following case report will highlight the diagnostic difficulty of such a tumour viz. a thalamic tumour, and emphasize the importance of psychiatric assessment in early diagnosis of such tumours.

CASE REPORT

A 40 years old Chinese clerk was admitted to the psychiatric ward in February 1979 with a diagnosis of reactive depression. Six months prior to admission, he said he was told by friends that his wife had been having an affair. Since then he had lost concentration in his work and had to bring his work home to complete. Initially, he had difficulty in sleeping but later, for the past three months, he was noticed to be sleepy most of the time and getting tired easily. Three weeks before admission, he was called up by his employer and informed that he was far behind in his work. He was threatened with dismissal if he did not show progress. This distressed him even further and his symptoms became worse. He was tired most of the time and sometimes complained that he did not even have the energy to walk. He kept to himself and stopped playing with his children. His appetite was poor. He complained of giddiness occasionally. Sometimes, when he was driving, he took the wrong turning. He was forgetful and had to be reminded to bathe, eat and brush his teeth. A diagnosis of reactive depressive illness was made on that occa-

sion in the out-patient clinic. He was started on amitriptyline 50 mg o.n. and told to come back in a fortnight. He made no improvement and was told to come into hospital.

On admission, he was rather withdrawn. He appeared to be in a daze. His speech was slow but he was coherent and relevant. His affect was flattened and he admitted feeling depressed, although he expressed no suicidal thoughts. He had no delusion or hallucination. He was well orientated to place, time and person. His remote memory was good but his recent memory and 5 minute recall was poor. He was able to think abstractly. He had good attention and was able to complete the serial seven test satisfactorily. His judgement was good. As for insight, he felt that he was sick because of 'weak nerves'. Physical examination revealed no abnormality at that time.

In the ward, he was idle most of the time. He was rather demanding and expected food to be brought to him, although other patients usually helped themselves. He was noted to be very precise and deliberate in his movements when he fed himself. When he changed his clothings, he discarded the old clothes on the floor, expecting the nurses to pick them up. In the ward, during visiting hours, it was noticed that his wife cut his nails and also helped with other matters. Apparently, she often did this while at home.

One week after admission, on reassessment, he was found to have poor orientation. He gave the date as 6th January 1979 when it was actually 8th February 1979. However, he was able to state that Chinese New Year was on 29th January 1979 but added that it was not over yet. His topographical orientation was poor as he was unable to give the directions from the nurses station to his bed. Yet he was able to find his way to the toilet. He was forgetful and complained that someone had stolen his clothes when actually, he had put them in the locker, a while earlier. He was unable to remember if he was visited the previous day. However, he was able to recall his children's ages and the schools they attend. Although he complained of weakness of his legs, there was no loss of muscle power. When another patient irritated him, he was able to get up steadily and chased him away. At this stage, he was tentatively diagnosed as having an organic

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brain syndrome and further investigations were ordered. A differential diagnosis of depressive pseudodementia was also considered as he appeared depressed and withdrawn and some of his symptoms was inconsistent. The latter differential diagnosis was strengthened when he made an initial improvement, appearing brighter and more spontaneous in his speech and action after being treated with amitriptyline 25mg t.d.s. He was able to go out to the day space and play table tennis, and socialize with other patients. He was seen reading story-books and newspapers. During the ward party, he voluntarily got up and danced with a female patient. He was able to collect his food-tray from the pantry and fed himself without spilling the food. When he took his bath, he knew exactly what he needed, namely his clothes, towel, soap and comb. Yet his orientation to date continued to be poor, although he was always just a few days off. However, on one occasion, when he doctor himself made a mistake in the dates, he was quick to make the witty suggestion that the doctor should get his own head examined. When he was seen reading the newspaper, he was able to recall what he had read, although at times, he made up his own story, when he could not remember. Usually, he was able to find his own bed but occasionally, he ended up in the wrong bed. At times, he was found standing in the bathroom, with the taps running and the sink overflowing. He was also seen walking around in his underwear and on one occasion, naked. Once, he took an empty dustbin and wanted to put it on his head. However, when stopped, he was able to put the dustbin back to its original place with no difficulty at all. It was noticed that his behaviour was more "child-like" when his wife was around, suggesting that he was employing "hysterical mechanisms."

Three weeks after admission, his behaviour became more regressed. He developed incontinence of urine. He was messy and spilled his food. He was noticed to be unsteady on his feet. He was referred to the neurologist who was unable to detect any localizing signs. The only positive findings were pathological withdrawal and positive chaddock's reflex of both feet, and equivocal palmomental and rissel's reflex.

His urine, full blood count, blood VDRL and TPHA tests were normal, as were his chest and skull x-rays. He had difficulty in copying accurately the simple designs in the Bender Gestalt test, and yet was able to draw a man accurately with elaborate details. Psychological testing was done, but as he was generally slow, it was interpreted with caution, but suggested that his clinical picture was organic, probably due to a fast growing lesion. His score was generally low

on the WAIS. Lumbar puncture was clear, with negative culture. His EEG recorded in wakefulness was moderately abnormal. The abnormality appeared to be localized to the right anterior quadrant especially the temporal and the adjacent superior frontal region. The findings were reported as consistent with that seen with a focal lesion such as a space-occupying lesion localized to that region. However, his cerebral dynamic study and static brain scan appeared normal. He was finally sent on 5th March 1979 for a computerized axial tomography (CAT) scan, which showed conclusively, a space-occupying lesion over the right thalamus, causing obstructive hydrocephalus. (Fig. 1 and 2)

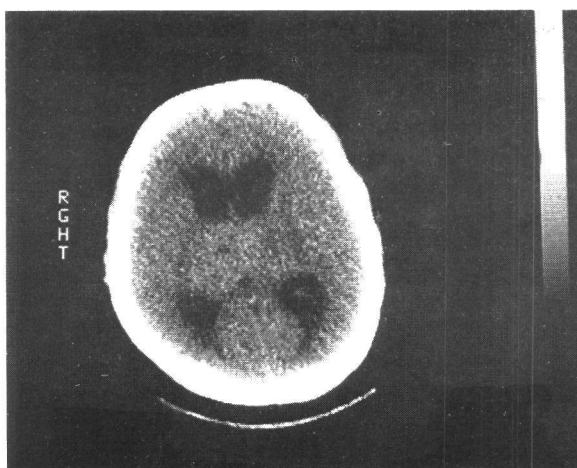


Fig. 1 Pre-Contrast examination showing shift of the third ventricles and lateral ventricles.

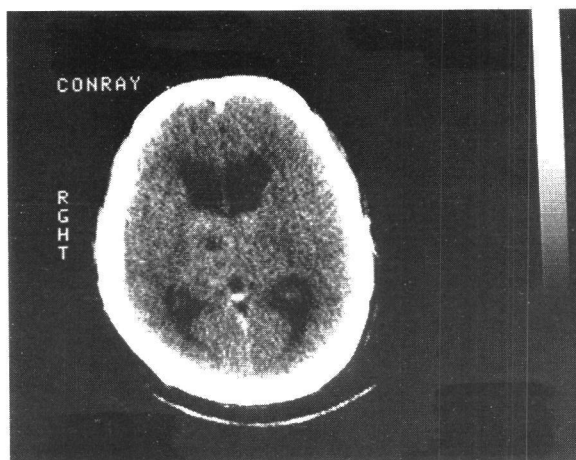


Fig. 2 Post-Contrast examination shows an enhanced area over the right thalamic region and extending into the 3rd ventricle.

PROGRESS

The patient was transferred to the medical ward for further management. An angiogram was done which revealed a tumour of moderate vascularity. The neurosurgeon was consulted and he was of the opinion that surgical procedure was not advisable. The patient was offered radiotherapy but his wife refused as she was adamant on having surgery performed in China in spite of being advised against it. Most authors are of the agreement that direct operative attack is not the treatment of choice, except in the unusual occurrence of a vascular malformation (Payne, 1974). Palliative surgical measures are advised, with the most suitable being ventriculocisternostomy followed by radiotherapy. Other workers advocated radiation therapy alone, at the same time with a plea for early diagnosis.

The prognosis for this patient is poor, in view of his rapid deterioration. In general, patients do not usually survive for more than a few years (Payne, 1974).

DISCUSSION

The differentiation between depression and a fluctuating or progressive dementing process is an increasingly frequent problem in diagnosis and management as both conditions occur more frequently with advancing years. Occasionally, an early organic process may be overlooked, particularly if behavioural changes occur with little or no intellectual impairment or if the condition is masked by the florid features of a functional psychosis (Kiloh 1961). This is the situation in this patient, who presented with the features of a depressive illness. When he showed memory disturbance and poor orientation, it was felt that the picture could still be that of a depressive pseudodementia as described by Kiloh (1961). This condition is of a functional origin where there is sufficient confusion and memory impairment present, that the picture of dementia is closely mimicked. The most common condition in which the erroneous diagnosis of dementia is made is in endogenous depression. As a result of loss of concentration and severe retardation, there is poor registration, resulting in an apparent failure of recent memory, inaccurate orientation and a poor knowledge of current events. Some carelessness in personal habits due to depressive preoccupation and neglect of the personal hygiene may strengthen the impression of dementia. Kiloh advised that at any age, every time the diagnosis of dementia is being considered, the possibility of depression is worth bearing in mind. However, in this patient, the reverse is true. His dementia was initially thought to be due to depression. Therefore, it is advisable that everytime the diagnosis of a depressive ill-

ness is being considered for the first time in an older person, the possibility of dementia should be entertained and the patient's memory and orientation should be tested at regular intervals, besides the neurological examination.

The patient's favourable response to antidepressants added confusion to the diagnosis as it suggested a depressive illness. However, it must be noted that depression can be a feature of brain tumours (Mulder and Swenson, 1974) and dementia (Roth and Myers, 1969). Initial response to antidepressants is due to the amelioration of the depression in such patients.

The inconsistency in the patient's cognitive impairment was thought to be due to hysterical mechanisms. Although his orientation for time was poor, yet he was never far off the mark, and these approximate answers were similar to that seen in the Ganser Syndrome (Whitlock, 1967) and reinforced the impression of pseudodementia. It is known that in pseudodementia, the patient may do badly on some simple tests of memory and intellect but unexpectedly well on others, and his performance varies considerably from day to day. In retrospect, however, this inconsistency in cognitive function is quite acceptable as mental symptoms of patients with brain tumours are most varied, not only from patient to patient, but also in the same patient from hour to hour (Mulder and Swenson, 1974).

The relative absence of neurological signs is not surprising considering the site of the tumour in this patient. Thalamic tumours are relatively rare, accounting for approximately 1% of all cerebral neoplasms (Payne, 1974). They tend to occur more frequently in the males than females. The duration of reported symptoms from initial onset to time of hospitalization is quite short as in the case of this patient, usually less than six months. Headache is the typical first symptom. Other signs of increased intracranial pressure soon follow, including nausea, vomiting, apathy, drowsiness, mental and emotional changes, the most frequent of which are confusion, memory loss, emotional lability, indifference, apathy and mental dullness. Frank psychotic manifestations may be present. In retrospect, this patient's suspicion of his wife's infidelity is probably a delusion. Our interview with her showed that this was not a real problem. Thalamic dementia is seen when there is a rapid evolution of memory loss progressing to profound dementia, especially when there is bilateral involvement affecting the medial thalamus (Payne, 1974). Hemiparesis is the most common physical finding, followed by papilloedema and eye signs such as visual field defect and abnormal pupillary reaction. However, this patient did not have all these signs at all, except much later, when he had ataxia

and incontinence of urine. The initial signs and symptoms are usually caused by increased intracranial pressure which tends to occur early because of the proximity of these lesions to the outflow tract of the third ventricle. In addition, dementia is particularly likely to occur when the tumour is at the region of the third ventricle (Kiloh, 1961). This is probably due to the resultant hydrocephalus. The classical thalamic syndrome is a relatively infrequent occurrence, although in many cases, features of the syndrome appear when sensory changes occur (Payne, 1974). Brain and Walton (1969) stated that thalamic over-reaction is most often seen after vascular lesions and is rare after other types of lesion. Damage to the lateral nucleus is necessary for it to occur.

This case report highlights a few points in the diagnostic difficulties that may occur in differentiating between depression and dementia. It is advisable to consider the possibility of an organic brain syndrome every time the diagnosis of depressive illness is being entertained, especially in patients who become ill for the first time after the forties. When a diagnosis of organic brain syndrome is strongly suggestive on history, even in the absence of positive neurological findings, further investigations such as EEG, psychological testing, brain scan and CAT scan should be carried out. A negative brain scan does not exclude the possibility of small tumours. The CAT scan is an effective and painless ancillary aid, as demonstrated in this case.

SUMMARY

Psychiatric symptoms frequently are the initial and occasionally the only symptoms of intracranial tumours. Such symptoms may precede by days or even months, the more obvious motor or sensory symptoms and findings of brain tumour. A case is presented to highlight the diagnostic difficulties of such a tumour, viz. a thalamic tumour, and emphasizes the importance of psychiatric assessment in early diagnosis of such tumours. The differentiation between depression and a fluctuating or progressive dementing process is an increasingly frequent problem in diagnosis and management as both conditions occur more frequently with increasing years. It is advisable to consider the possibility of an organic brain syndrome every time the diagnosis of depressive illness is being entertained, especially in patients who become ill for the first time after the forties.

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SALVAGING "HOPELESS" POST HEAD INJURY PATIENTS

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INTRODUCTION:

THE MANAGEMENT of head injuries has always been a matter of serious concern for those involved in the care of such critically ill patients. The neurosurgeon, the anaesthesiologist and sometimes the neurologist, form a closely-knit team in the management of such patients who are ideally cared for in intensive care or critical care units.

With the increase in motor traffic and the number of motorised vehicles on Malaysia roads we are seeing an increase in the number of head injured patients. The number of head injured patients has risen to alarming figures in the more industrialized countries. In a study by Jennet (1975) it was found that over 33% of admissions to accident units were due to head injuries. Very often these patients belong to younger age groups or to the most useful working ages. In 1973 in England and Wales, 16% of all fatalities in males between the ages of 15 and 40 were attributable to head injuries (Registrar General, 1975). It is indeed a tragic loss of human life in their prime. It is, therefore, not surprising that more attention is being paid to the care of these patients both in the acute phase and in the prolonged care.

Early teachings on management of head injuries emphasised the fact that when a brain lesion was not amenable to surgical treatment, especially when there were severe clinical symptoms, the prognosis was poor. Further management was mostly of routine nursing care and sedation when indicated. Care of the airway and respiration were hazardous due to lack of suitable trained personnel

and the absence of intensive care units in the country. Even with the advent of intensive care units in Malaysia, initiation of laborious and personnel-requiring series of treatment are withheld in patients in whom the outlook is considered "hopeless". It is, therefore, not surprising that the mortality or a permanent morbidity is high in such patients.

In this paper we report 17 cases of severely head injured patients in the younger age group who were managed in the multi-disciplinary Intensive Care Unit of the University Hospital, Kuala Lumpur, over a 2 year period.

MATERIAL AND METHOD:

17 young patients (age range: 3 - 14 years) with head injury (sub-dural haematoma and intra-cerebral injury or brain stem injury with generalised cerebral edema) and showing signs of decerebration had exploratory craniotomy with evacuation of any haematoma found and haemostasis.

Post-operatively, these patients were managed in the Intensive Care Unit and the regime of management consisted of mechanical intermittent positive pressure ventilation (IPPV), regular administration of Dexamethasone intravenously, mild hypothermia to maintain temperature at $34 \pm 2^\circ\text{C}$ and regular timed administration of Diazepam intravenously. All patients were paralysed with a non-depolarising muscle relaxant. Nasotracheal intubation with PVC endotracheal tube was preferred in the first two weeks of management. The regime was followed for a period of 4 - 5 days.

RESULTS:

11 (64.7%) of the 17 patients died; 4 of them died during the regime and the other 7 succumbed later. The latter patients had prolonged unconsciousness and were tracheostomised to assist in the spontaneous respiration and for tracheo-bronchial clearance of secretions.

6 patients (35.3%) regained consciousness within 1 - 14 days after cessation of the regime and their recovery is graded as shown in Table 1. 3 were of category A, while there were one each of the remaining categories B, C and D.

Neurological deficits observed were altered personality, limb weakness, unsteady gait and speech defects.

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TABLE 1: CLASSIFICATION OF SURVIVING PATIENTS

CATEGORY A: (3 Patients)	<ul style="list-style-type: none"> i) No neurological deficits. ii) Back to normal activity within 3 months.
CATEGORY B: (1 Patient)	<ul style="list-style-type: none"> i) Neurological deficits persisting for 3-6 months. ii) Back to normal activity within 3-6 months.
CATEGORY C: (1 Patient)	<ul style="list-style-type: none"> i) Neurological deficits persisting for 6-12 months. ii) Back to normal activity within 6-12 months.
CATEGORY D:	<ul style="list-style-type: none"> i) Neurological deficit persisting for more than 12 months.

DISCUSSION:

The management of head injured patients should ideally be carried out by a team consisting of the neurosurgeons, anaesthesiologist and sometimes the neurologist. Involvement of the anaesthesiologist has stemmed from the observations that early attention to maintenance of adequate airway has improved the prognosis of these patients. Echols *et al.* (1950) recommended tracheostomy on every unconscious head injured patient if it was considered that the coma would last longer than 24 hours. Huang *et al.* (1963) and Rossanda *et al.* (1966) have shown that this is the only way of ensuring a clear airway of comatose patients. There is now no doubt as to the importance of maintaining a free airway in the management of head injured patients. However, we do not tracheostomise our patients immediately. With the use of PVC endotracheal tubes with soft cuffs it is now possible to keep these tubes in the trachea for about 2 weeks without causing any serious damage to trachea. Tracheostomy is done if the coma lasts for more than 10 days.

A spontaneous over ventilation is often observed on head injured patients after establishing a clear airway. This leads to respiratory alkalosis and a raised arterial pH. (Frowein, 1970; Brown, 1970). Severely head injured patients may over ventilate to a stage of exhaustion which is further augmented by severe restlessness and decerebrate cramps. Sedatives, when used, calms the patients but always results in deterioration of the clinical condition.

The brain lesion creates intracerebral metabolic acidosis which is believed to initiate spontaneous hyperventilation (Kaasik *et al.* 1969). Experimental evidence shows that small shifts of as little as 0.1 unit from normal CSF pH are sufficient to cause changes in respiratory rate. (Pappenheimer, 1967). Zupping *et al.* (1971) have shown close correlations between the severity of intracerebral acidosis, brain injury and the degree of hyperventilation.

Spontaneous hyperventilation is an attempt to restore the intracerebral pH to normal levels by rapid elimination of carbon dioxide. A normal cerebral pH is of fundamental requirement for maintenance of normal vasomotor tone, decrease of brain edema and intracranial pressure (ICP). Restitution of blood supply, resulting from normal ICP and vasomotor tone, to certain parts of the hypoxic brain diminishes the area of brain which might otherwise suffer permanent damage.

Though spontaneous hyperventilation is a useful protective mechanism it has several disadvantages. Heavy burden on the heart resulting from extra work of breathing, restlessness and decerebrate cramps soon leads to myocardial insufficiency and sometimes cardiac arrest. The patients may become exhausted and reduced pulmonary gas exchange may cause hypoxia and hypercarbia with catastrophic effects on cerebral blood flow and intracranial pressures. This may also be produced by sedative drugs used to control restlessness.

Controlled hyperventilation, on the other hand, allows adequate sedation, relieves muscular overwork, maintains adequate pulmonary gas exchange and allows administration of higher concentration of oxygen when indicated. Finer control of PaCO₂ levels is possible with controlled ventilation. PaCO₂ plays a major role in the control of cerebral blood flow and ICP. Controlled hyperventilation is known to decrease ICP and it may also partially compensate for the low intracerebral pH (Gordon and Rossanda, 1970).

Role of Steroids in Reducing ICP

Steroids are commonly used in the treatment of brain edema. Dramatic decrease in ICP is seen when the brain edema is due to brain tumors. The use of steroids in head injured patients is still controversial. Hoyt *et al.* (1972), showed no beneficial effect of dexamethasone when compared with a placebo in a double blind trial. Ransohoff (1972), in a double-blind study of patients with acute head injuries showed a tendency to an improved survival rate and a better quality of survival in the steroid treated group. However, this was not statistically significant because of the small number of patients. An increased survival rate in head injured patients treated with methyl prednisolone was re-

ported by Sparacio *et al.* (1965). However, Tornheim *et al.* (1978) in reviewing several clinical trials as well as experimental studies concluded that the controversial data that are presently available suggest that steroids are not as effective with traumatic brain edema as they are with edema stemming from other intracranial pathologies. In our patients we are not able to say whether the use of steroids influenced the final outcome since we had no control.

Hypothermia in Head Injured Patients:

Hypothermia decreases the metabolism and the oxygen requirement and therefore protects the neurones from ischaemic damage. Experimental study by Rosomoff (1959, 1961) showed that the beneficial effect of hypothermia occurred only when the body temperature was reduced before the injury had taken place. Some effect may be observed if hypothermia is induced within three hours of injury and no effect could be demonstrated if the treatment is initiated after seven hours.

Hyperthermia, on the other hand, has highly damaging effects on neurones and must be prevented. Temperature should not be allowed to rise above normal. It is for this reason we maintain the temperature of our head injured patients at $34 \pm 2^\circ\text{C}$.

All the 17 cases we managed showed signs of decerebration. The mortality of 64.7% is similar to that reported by Bricolo *et al.* (1977) in such patients. In decerebrate patients age does not affect mortality rate whereas in non-decerebrate patients the mortality increases significantly with age.

5 out of the 6 patients who survived in our series were back to normal activity within 12 months. The results obtained in this limited series have influenced us to give such patients the maximum possible chance for survival. Based on this preliminary small series we are now managing severely head injured patients with the aid of continuous I.C.P. monitoring to guide us rationally in controlling the I.C.P.

The quality of survival following severe head injury is of paramount importance to justify the great amount of money and human resources spent in the management of such patients. In our series 29% of our patients recovered sufficiently to resume their former activity within 12 months and, therefore, abandoning these patients appears to be unacceptable. However, with aggressive management of severely head injured patients it is possible to salvage a patient in a "persistent vegetative state" (Jennet and Plum, 1972). It is virtually impossible to differentiate in the early stages those who would recover fully from those who would be in a persistent vegetative state. The uncertainty of prognosis therefore leaves no option but to aggres-

sively treat all head injuries. Survival of some patients with permanent physical or mental handicaps is a price that must be paid to salvage some patients who would recover sufficiently to lead a normal life.

SUMMARY:

17 patients with severe head injuries were managed in the multidisciplinary Intensive Care Unit after craniotomy. The post-operative management consisted of Intermittent positive pressure ventilation, regular intravenous administration of dexamethasone, mild hypothermia and regular intravenous diazepam. Of the 17 patients, 6 patients survived. 5 of the surviving patients were back to their normal activities within 12 months. Based on this study it is felt that all severely head injury patients must be aggressively treated, survival of a few patients in a persistent vegetative state is inevitable if such a course of management is pursued.

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HEPATIC ARTERY LIGATION IN LIVER TRAUMA

S. RADHAMANALAN & ISSAC THOMAS

INTRODUCTION

HAEMORRHAGE is the main cause of death in patients with liver trauma. Presently, treatment of ruptured liver is mainly done in large General Hospitals where surgeons and anaesthesiologists are easily available and where blood is plentiful. But nearly all accident victims are transported to the nearest and smaller hospitals. By the time these patients are transferred to the bigger hospitals, these patients are more often than not, dead.

Hepatic hemostasis, a life saving procedure, can be obtained in a number of ways. Hepatic Artery Ligation (HAL) is the easiest, most rapid and simplest technique for treating hepatic trauma described in this century. It requires no special instruments and any qualified surgeon can do HAL in any operating theatre. (May, 1977).

In this paper, we make a report, the first from Sabah, of two cases of HAL done on patients who came in with ruptured livers.

CASE REPORTS

Case 1

In early October 1977, a 25 years old Bugis male labourer was brought to the General Hospital Tawau, with a history of being hit on the left side of the face and the upper abdomen by a log occurring about 1 hour previously. On admission he was pale and had a poor volume pulse of 130 per minute and a blood pressure of 90/50 mm Hg. Abrasions were present on the left cheek and upper abdomen. There was guarding on abdominal palpation. Blood was aspirated from the peritoneum.

At operation shortly after admission, about 1500 c.c. of fresh blood was present in the peritoneum. a large transverse rupture across the right lobe, extending to the porta hepatis was found. Active bleeding was present. Control was easily affected by occluding the right hepatic artery with vascular clamps. The artery was then tied and no further bleeding occurred on removal of the clamps. A cholecystectomy was

then done. A total of 5 pints of blood was transfused. A liver function test ordered the next day gave the following result:-

Serum bilirubin 4.6 mg/dl, SGPT: 220 SFU/ml; Total protein:- 6.8 gm/dl, Serum Albumin:- 3.5 gm/dl, Globulin:- 3.3 gm/dl and Alkaline Phosphatase:- 1.3 su/ml. About 3 weeks later serum bilirubin was 1 mg/dl, SGPT:- 43 sfu/ml, Total proteins:- 6.3 gm/dl, Serum albumin:- 2.6 gm/dl and Serum globulin 3.7 gm/dl, alkaline Phosphates:- 4.3 su/ml, The patient was discharged after 7 weeks.

Case 2

A 23 years old male Toraja was admitted to the Tawau General Hospital in July 1978, after a road traffic accident occurring at about 8 hours previously. He was referred to us from the Lahad Datu District Hospital, about 150 miles from Tawau. His pulse was 110 per minute and the Blood Pressure was 110/60 mm/Hg. There was generalised abdominal tenderness and guarding.

At operation the patient was found to have ruptured the right lobe of the liver, a tear in the right dome of the diaphragm, a small rupture in the upper jejunum and the peritoneal cavity contained about 4.5 litres of blood. Bleeding was controlled by ligating the common hepatic artery. Part of the right lobe of the liver was resected and the remaining part sutured. The tear in the diaphragm and the bowel was repaired. The gall bladder was removed. During the operation 6 pints of blood was transfused.

The patient's convalescence was complicated by the development of renal failure. This was successfully dealt with. 3 days after the operation the serum bilirubin was 2 mg/dl, SGPT 180 sfu/ml, total proteins 7.7 gm/dl, serum albumin 2.4 gm/dl, serum globulin 5.3 gm/dl, alkaline phosphatase 4.9 su/dl, serum globulin 5.3 gm/dl, alkaline phosphatase 4.9 su/ml. When repeated 1 month later, serum bilirubin was 0.6 mg/dl, SGPT 9 sfu/ml, total proteins 6.7 gm/dl serum albumin 1.9 gm/dl, serum globulin 4.8 gm/dl, Alkaline phosphatase 2.5 su/ml.

DISCUSSIONS

Intentional HAL has been considered from time immemorial, to be radical departure from

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acceptable medical practice. These unfounded fears were based on extrapolation from experimental work on animals, the early work of Graham and Connell (1933) and the erroneous belief that hepatic arteries were end arteries.

Hepatic surgery requires precise knowledge of anatomy and a clear understanding of hepatic metabolism. (Adson and Beart, 1977). The location, configuration and the complexities of the hepatic vasculature are added risks in liver resections.

There are many indications for HAL. The most common and most important is to stop bleeding from a traumatised liver. HAL is a quick, simple and highly effective means of stopping haemorrhage from the ruptured liver (Aaron *et al.*, 1975). HAL, besides being simpler than applying absorbable haemostatic agents and major hepatic resections, is also most useful when bleeding points are deep in the substance of the liver (Madding *et al.*, 1977). There is virtually no place in modern surgery for gauze packing of the liver as sepsis and recurrent bleeding are almost inevitable sequelae (Walt, 1969). It must no doubt be emphasized that in the event of a massive destruction of liver tissue, there remains no reasonable alternative to a hepatic lobectomy.

The right or left hepatic artery may be ligated if the lesion is situated in an unequivocally definable anatomical division, but ligation of the proper hepatic artery or common hepatic artery is also acceptably safe (Walt, 1969).

The gall bladder should be removed when any hepatic artery is ligated, for it produces stasis of the bileflow or varying degree of obstruction and inflammation (Mays, 1977).

As the liver is the main metabolic centre of the body, metabolic disturbances invariably occurs after hepatic resections. Following large resections, metabolic deficiencies may result, namely, hypoglycemia, hypoalbuminaemia and bleeding diathesis. Basically, the postoperative care of patients with hepatic injury is supportive in nature (Madding *et al.*, 1977). When the hepatic artery is ligated, hepatic hypoxia occurs. To avoid this, blood flow and oxygen content of the portal blood must be sustained at optimal levels for the first few post-operative days (May, 1977; Walt, 1969).

Though liver functions tests are available to detect and evaluate disorders of the liver, many of these tests measure activities not confined to the liver (Rosoff and Rosoff, 1977). Four laboratory tests, namely blood glucose, serum albumin, serum bilirubin and blood ammonia, reflect with moderate accuracy the overall state of liver function (Stone, 1977).

Intravenous glucose supplementation, which may be required for as long as three weeks,

corrects the hypoglycaemia. Stone (1977) believes oral alimentation will usually provide sufficient free carbohydrate by the tenth postoperative day.

As the liver is the only endogenous source for human albumin, any disturbance to the metabolic activity of the liver, will result in hypoalbuminaemia. It may take four to six months before the serum albumin passes into the normal range. This, Walt (1969) views, reflects on the regenerative capacity of the liver.

Transient mild elevations in serum bilirubin are of little concern (Adson and Beart, 1977). This may reflect the swelling of the regenerating hepatic cells (Walt, 1969).

The liver will regenerate completely in about six months, provided the remaining of the liver parenchyma is viable (Stone, 1977, Walt 1969).

Although we acquire yearly new and more sophisticated aids to surgery, they are but additional means to apply these principles which, if one simplify even further, rest upon nothing more complicated than a sound knowledge of anatomy and the ability to apply an adequate modicum of good, honest common sense (Smith, 1978). We tend to agree.

ACKNOWLEDGEMENTS

We wish to thank Dr. Mechiel K.C. Chan, Director of Medical Services, Sabah for his permission to publish this article. Thanks is also due to Sister Getrude Domingo and her nurses in the Surgical wards, whose efforts have so improved the prognosis for many of our patients. Finally the typing assistance of Miss Rose Ho and Puan Salmatun is gratefully acknowledged.

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AORTIC ARCH ANOMALIES: TREATABLE CAUSES OF DYSPHAGIA AND RESPIRATORY DISTRESS

H.S. SAW, K.H. LIM, J.SINGH & K.T. SINGHAM.

INTRODUCTION:

VASCULAR RINGS, either complete or incomplete, formed by abnormalities in the aortic arch vessels, can compress the trachea and oesophagus to such an extent as to cause respiratory distress or dysphagia. Symptoms may appear at any age. Although surgical management may be complicated by residual respiratory distress and a stormy post-operative course, these are benign conditions and attempts should be made to relieve the obstruction. A high index of suspicion is im-

preative, so that appropriate investigations and treatment can be embarked upon early in the clinical course.

This paper reports on 3 patients presenting with symptoms indicative of aortic arch anomalies.

Case 1:

C.A.M. an 18 year old female, presented with a 2-year history of mild dysphagia to solid food. There was no history to suggest previous ingestion of corrosives. Clinically the patient was well nourished and no obvious abnormalities were detected on physical examination. The barium swallow examination performed revealed on oblique posterior indentation of the oesophagus (Fig. 1) suspicious of an aberrant right subclavian artery. This was subsequently confirmed on arch aortography (Fig. 2). In view of her mild symptoms, no surgical intervention was contemplated. After 2 years of medical surveillance, she defaulted.

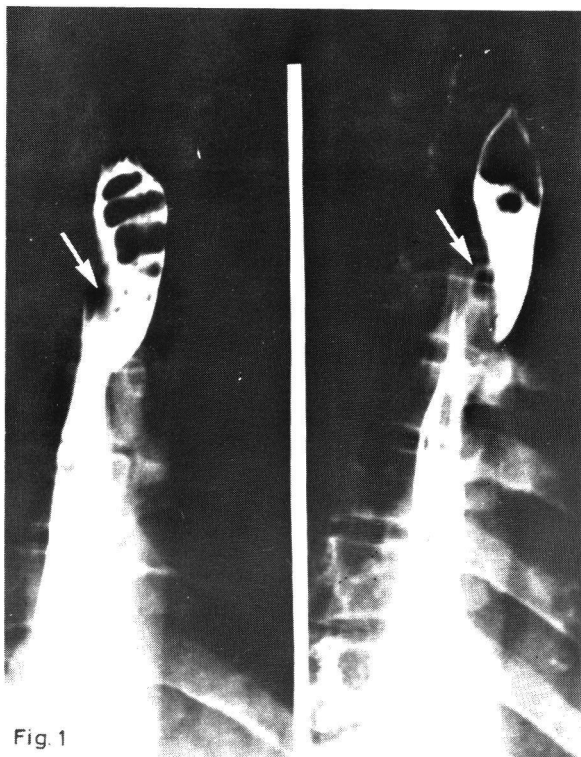


Fig. 1

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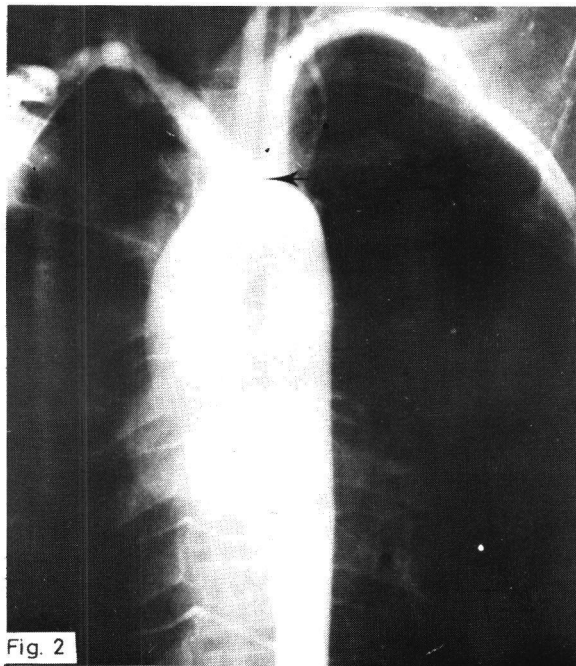


Fig. 2

Case 2:

Z.B.Z., male, aged 8 months was first known to us soon after delivery when he was found to

have an imperforate anus, bilateral preauricular sinuses and a submucous cleft palate. An anal cutback was performed and this was followed by regular anal dilatation on an outpatient basis. During these visits, he had often been noted to be growing very poorly. One week prior to his present admission, he developed a fever associated with a cough and respiratory difficulty. Direct questioning revealed that he fed poorly — although he was able to suck well, he had difficulty swallow-

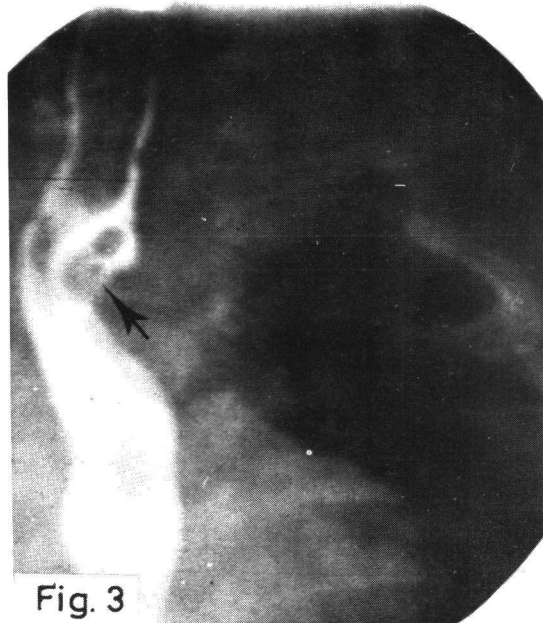


Fig. 3

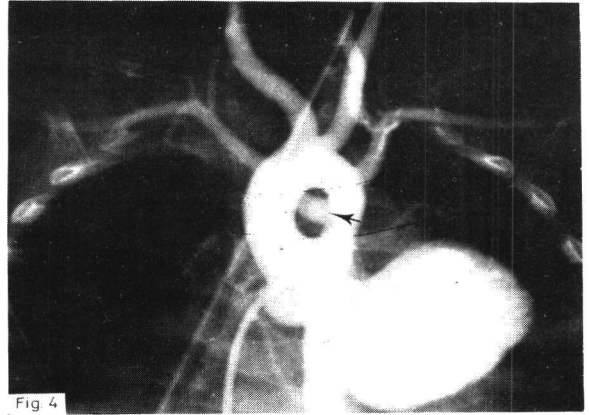


Fig. 4

ing and was often noted to be drooling with saliva.

Clinical examination revealed a small, wasted infant. He was febrile, tachypnoeic, anaemic and dehydrated. There was mild intercostal recession and crepitations were heard over both lungs. Chest x-rays suggested bilateral bronchopneumonia and the child was treated accordingly. Because of the history of swallowing difficulty, a barium swallow was performed and this showed a posterior indentation of the oesophagus (Fig. 3). Aortography confirmed the presence of an aberrant right subclavian artery (Fig. 4). On the 18th hospital day, the chest was explored through a left thoracotomy. At operation, the anomalous subclavian artery was mobilised and divided at its origin. The post operative course was uneventful and at discharge the child was noticed to be able to swallow with no difficulty.

Case 3:

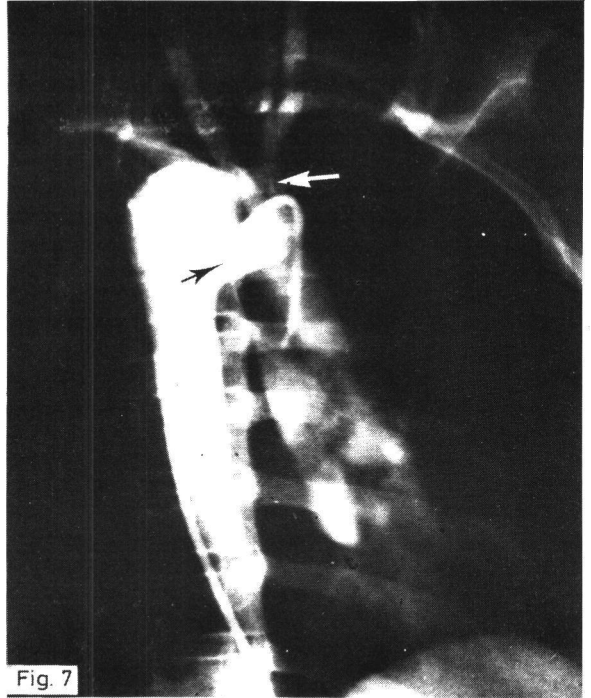
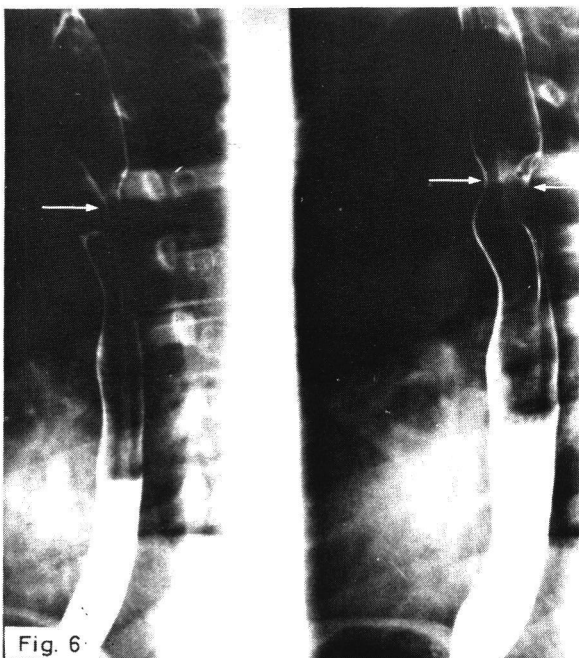
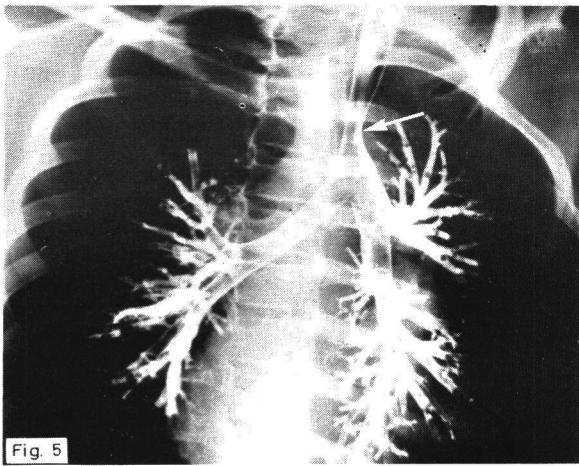
P. a 12 year old female was admitted with a one day history of productive cough and fever. Going back into her medical history it was noted that she was the product of a normal full-term pregnancy. However, at the age of 21 days, she was hospitalised for a period of 2 months for fever, cough and stridor. Since then she has had recurring episodes of cough productive of yellowish sputum. There was no history of dysphagia.

On examination, she was found to be febrile. Diffuse rhonchi and crepitations were heard over both lung bases. A chest radiograph done at this stage showed a right-sided aortic arch and evidence of bilateral basal bronchopneumonia. She responded well to antibiotic treatment and vigorous chest physiotherapy.

To exclude bronchiectasis, a bronchogram was arranged and this demonstrated a localised indentation of the left wall of the trachea just above its bifurcation (Fig. 5). At bronchoscopy, this tracheal narrowing was confirmed, in addition,

the posterior wall was observed to be pulsatile. Barium swallow examinations showed circumferential indentations of the oesophagus at the level of the aortic arch (Fig. 6). Subsequently, an arch aortogram was carried out and this revealed a double aortic arch with a right-sided descending aorta (Fig. 7). These findings were confirmed at exploratory thoracotomy. After freeing the anterior aortic arch, it was divided distal to the origin of the left subclavian artery. The ligamentum arteriosum was similarly mobilised, ligated and divided.

The post operative course was complicated by sputum retention which cleared with intensive physiotherapy. Tracheograms performed 3 months after the operation showed some persistence of



narrowing. Regular follow-ups were gratifying in that the child remained symptom-free and had put on weight satisfactorily.

legend to figures;

- Fig. 1 Barium filled oesophagus showing a long length oblique indentation suggestive of an anomalous origin of right subclavian artery. (Arrows showing the oblique extrinsic impression).
- Fig. 2 Arch arteriogram showing anomalous origin of right subclavian artery (arrow) from the left side as the last major branch of the aortic arch.
- Fig. 3 Barium filled oesophagus showing an oblique extrinsic impression (arrow) in its middle one third suggestive of an aberrant right subclavian artery.
- Fig. 4 Left ventricular angiogram showing the ascending aorta and its branches. The arrow indicates the presence of an anomalous right subclavian artery arising on the left side as the last major branch of the aortic arch.
- Fig. 5 Brochogram demonstrating a localised indentation (arrow) on the left wall of the trachea just above the bifurcation.
- Fig. 6 Oesophagogram showing extrinsic compressions on both sides of the oesophagus (arrows) at the level of the aortic arch.
- Fig. 7 Arch arteriogram showing a double aortic arch with right sided descending aorta. The small arch (arrow black) lies anteriorly with the left subclavian arising at the origin of the left arch (arrow white).

Discussion:

Since Bayford's (1794) first reported case of an aberrant right subclavian artery causing dysphagia, many different varieties of aortic arch anomalies have been reported. From a clinician's view point, the simplified clinical classification put forth by Bradham *et al.* (1968) seems useful. In brief, aortic arch anomalies fall into 3 groups. (Table I).

They manifest clinically by causing compression of the oesophagus and/or trachea. The four main presenting symptoms are stridor, cyanotic attacks, poor feeding or dysphagia and recurrent respiratory tract infections. In children, respiratory symptoms without dysphagia are more common. In adults, on the other hand, the trachea is more rigid and therefore more resistant to compression, so that dysphagia is the principle complaint. Symptomatology may be severe and be evident shortly after birth or it may be altogether absent so that some patients with arch anomalies may remain asymptomatic throughout life. The question frequently asked is, why do some patients remain symptom-free? Klinkhamer (1966) is of the opinion that an artery pressing on the oesophagus from behind, is not in itself sufficient explanation for the occurrence of compression. It is his belief that symptoms arise only if the flexible trachea and oesophagus are hindered from being displaced forward at the crossing of the retro-oesophageal vessel. This can occur, for example when both carotids arise together or close to each other on the aortic arch. (Normally, the innominate artery and the left carotid artery are separated by a distance of about 4cm.). Other workers (Bailey, 1955; Ekstrom, 1959) believe that respiratory distress is caused by aspiration as a consequence of the dysphagia. It is worth noting that both theories cannot explain why symptoms persist post-operatively in some patients.

In the management of these patients, an accurate anatomical diagnosis is imperative. This should include an arch aortogram to delineate the incriminating vessels. In aberrant right subclavian arteries, complete relief of symptoms can be obtained by surgical division of the first part of the artery as described by Gross (1946). The arm will have an adequate blood supply through collateral vessels communicating with the second and third parts of the subclavian artery. Vascular rings are best managed by division of the minor arch together with division of the patent ductus arteriosus or ligamentum arteriosum. To prevent residual compression by a large posterior arch, it has been recommended that the anterior arch should be suspended to the back of the sternum.

Post-operatively, these patients should be closely observed as the respiratory symptoms may take

TABLE I: Clinical Classification of Aortic Arch Anomalies

Group I: Complete trachea and oesophageal encirclement
— double aortic arch.
— right arch with P.D.A. or ligamentum arteriosum.
Group II: Compression of anterior portion of trachea without oesophageal involvement
— aberrant origin of innominate artery.
— aberrant origin of left carotid artery.
Group III: Compression of posterior portion of oesophagus with or without tracheal involvement
— aberrant right subclavian artery.

some time to regress. Numerous theories have been put forward to explain this residual respiratory compression. Nuboer (1951) was the first to suggest that persistent stridor is caused by softening and distortion of the cartilage rings of the trachea. Two types of tracheal defects have been observed. Firstly, there may be a stenotic or hypoplastic segment localised to the area compressed by the vascular encirclement. Growth here may be inhibited in utero by compression and this continues till the trachea is liberated. It is for this reason that some surgeons feel very strongly that surgery should be done as soon as the diagnosis is made. Secondly, in some the lumen of the trachea is not greatly diminished but the cartilages may be softened by ring pressure so that they collapse on inspiration. Whether this tracheomalacia is related to compression or whether it is a separate intrinsic entity is open to conjecture.

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BILATERAL INTERNAL CAROTID ARTERY OCCLUSIONS A CAUSE OF TRANSIENT ISCHEMIC ATTACK

A. Zulkifli

INTRODUCTION

TRANSIENT ischemic cerebral attacks (T.I.A) is a transient disorder of cerebral function, of less than 24 hours' duration with complete recovery. Commonly it lasts for minutes to an hour or two (Marshall, 1973). It tends to recur. It is a warning of an impending complete stroke as 40% of patients with T.I.A.s will have a major stroke within three years (Pearce, 1978). Treatable causes like hypertension, anaemia, polycythaemia, cardiac arrhythmias should be looked into.

T.I.A's involves the internal carotids and vertebrobasilar territory and its clinical features differ accordingly. Lesions of the internal carotid has a greater tendency to produce a stroke than that of vertebrobasilar. Hence the urgent need for angiography is in the latter, not only to localise the site of stenosis but also to rule out subdural haematoma, angiomas and meningiomas which may simulate a T.I.A. (Pearce, 1978).

A case of bilateral internal carotid artery occlusions in a hypertensive patient presenting with transient ischemic attacks and subarachnoid haemorrhage is reported.

CASE REPORT

Patient, a 34 year old male, developed recurrent episodes of unilateral weakness over the past two years. Each episode lasted from a few minutes to a few hours, and was associated with unsteady gait, headaches and occasionally had visual and speech impairment.

He was presently admitted (on July 1978) with the complaints of headaches, neck pains and vomiting.

Past history revealed that he had renal calculi 15 years ago, and had been hypertensive for the past five years. Investigations for secondary causes of hypertension were negative then. No relevant family history of hypertension or migraine was forthcoming.

On examination he was not pale or dyspnoeic but was drowsy. Blood pressure was 230/140 on both arms. Heart was enlarged but patient was not in failure. All peripheral pulses were felt and equal and there was no femoral lag. There

was no carotid, subscapular or abdominal bruit. No renal mass was felt. Fundi showed grade II retinopathy. Neck stiffness and Kernigs were positive. The patient was drowsy, otherwise the neurological examination was normal.

Lumbar puncture showed a uniformly blood stained C.S.F. Carotid angiogram revealed bilateral occlusions of the internal carotid about one inch from its origin (Fig. 1a, b). Vertebral angiography revealed collaterals between external carotid and arterial cerebral via the ophthalmic artery (Fig. 2) and between the vertebro-basilar and the post cerebral (Fig. 3). An aneurysm at the junction of internal carotid and posterior communicating artery was seen (Fig. 4). Renal angiography revealed stenosis of right renal artery (Fig. 5). Other investigations of transient ischemic attack were

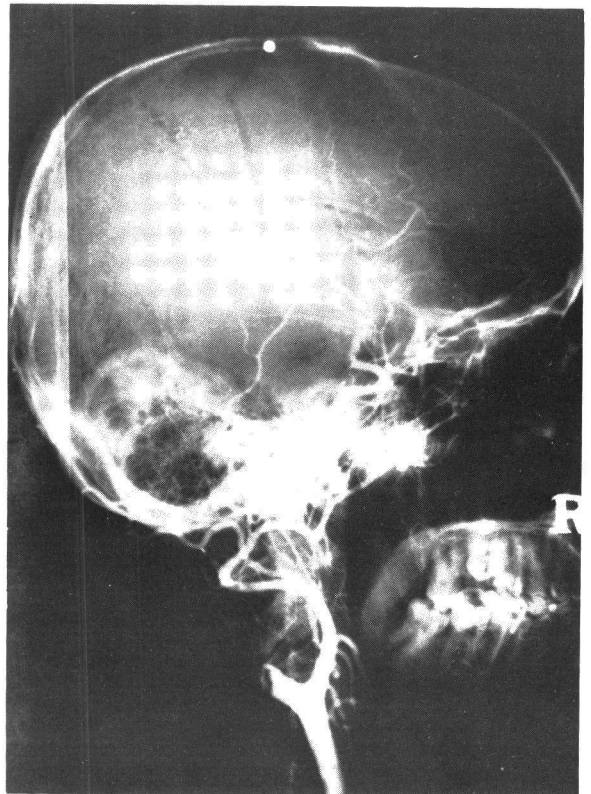


Fig. 1a. Carotid Angiography shows Occlusion of Right Internal Carotid Artery.

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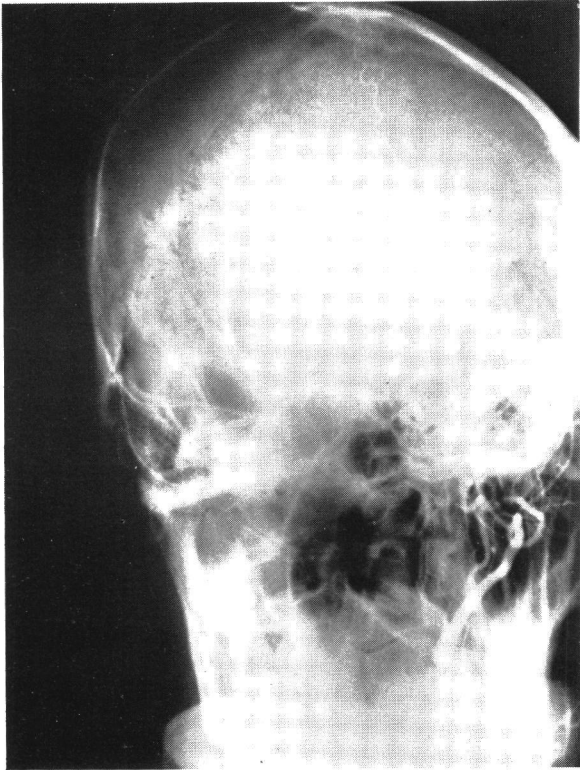


Fig. 1b. Carotid Angiography showing occlusion of Left Internal Carotid Artery.

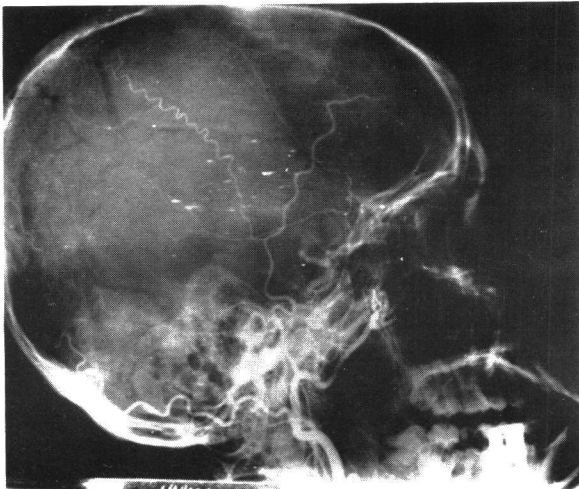


Fig. 2 Vertebral Angiography showing Anastomosis between internal and external carotid via ophthalmic artery.

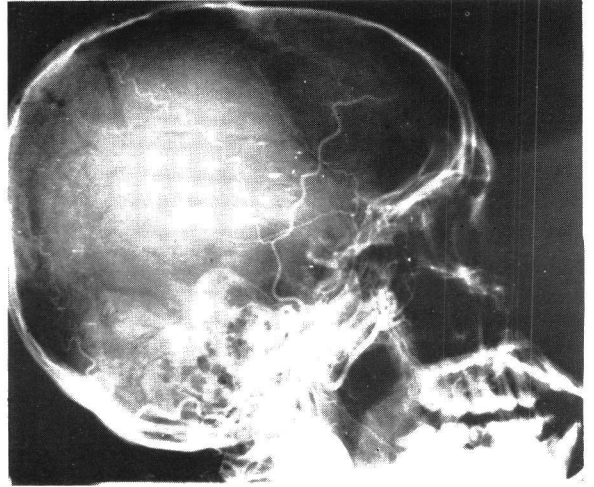


Fig. 3. Vertebrobasilar angiography shows anastomosis via posterior communicating artery.

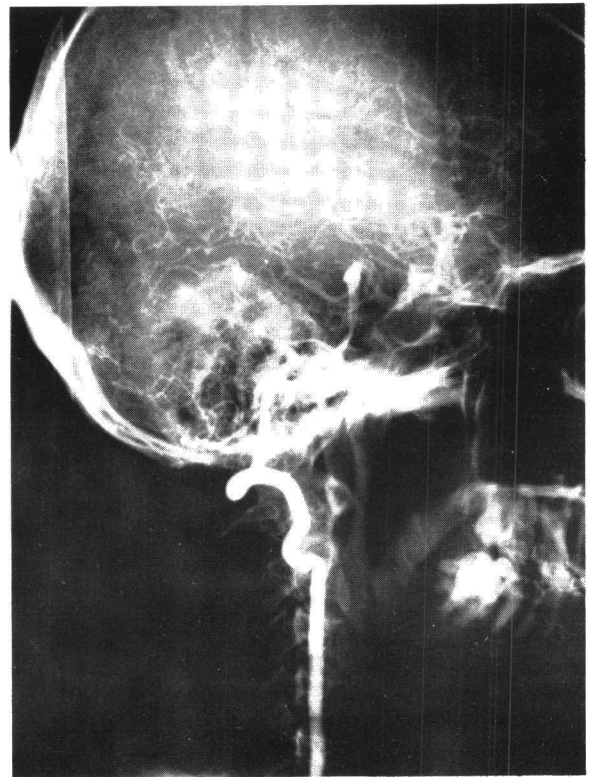


Fig. 4. Vertebrobasilar angiography showing aneurysm at junction of Internal Carotid and Posterior Communicating Artery.

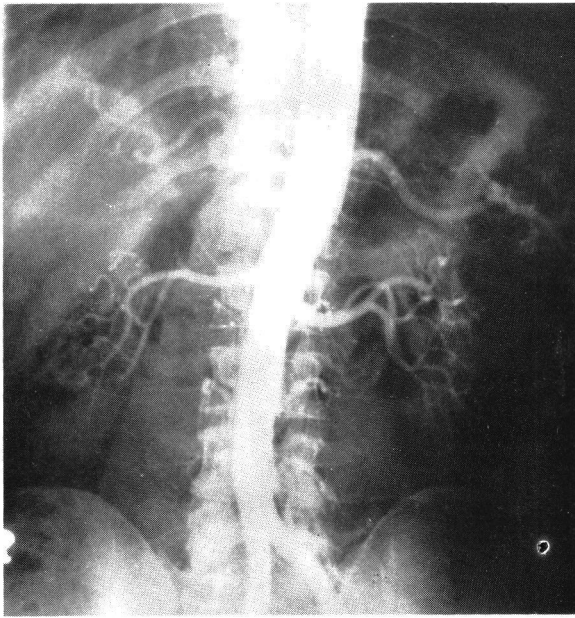


Fig. 5. Renal Arteriography showing stenosis of right renal artery and small right kidney.

normal except the ESR was 55 mm/hr. IVP showed a small right kidney and there was no stones. Urine cultures did not reveal any organism. Patient was treated for his hypertension and he recovered from his subarachnoid haemorrhage.

DISCUSSION

Hypertension is a known cause of T.I.A. Hypertension produces arterial degenerations in large arteries which spreads to smaller vessels as well as produces microaneurysms (Russel, 1973). Hypertension therefore can produce T.I.A. by inducing arterial degenerations, thrombosis as well as subarachnoid haemorrhage. Our patient have both T.I.A. and subarachnoid haemorrhage. Adequate treatment of hypertension reduces the risks of T.I.A. and stroke. Malignant hypertension can produce vasospasm resulting in T.I.A. (Marshall, 1973). In our patient no papilloedema was detected. Stenotic lesions of the extracranial vessels are unlikely to be found if the diastolic pressure is less than 110 mm Hg. (Marshall, 1973). Our patient have both hypertension and occlusion of the internal carotid!!

Recurrent headaches could be due to migraine. Patients with T.I.A. develop headaches due to the dilations of collateral vessels between internal and external carotids. Our patient has such collaterals via the ophthalmic vessels and posterior communicating. There was no history of head-

aches from childhood nor was there any family history of migraine.

Our patient had bilateral occlusions of the internal carotid about an inch from its origin. Du Boulay (1973) found that occlusions occurred at the bifurcations of the common carotid; the internal more severely involved than the external. 50% of T.I.A. has tight stenosis or occlusions of the internal carotid artery (Pessin, 1977). Only up to 30% of patient with T.I.A. have signs of extracarotid disease. Hence the importance to do carotid angiography in the young, as lesions of the internal carotid have a greater tendency to produce stroke. 50% of subarachnoid haemorrhage have hypertension (Uttley, 1978). In our patient it is unclear whether the cause is intracerebral haemorrhage or rupture of an aneurysm (congenital or acquired). With the availability of C.A.T. scanner, similar problems, in the future, would be solved.

SUMMARY

Patient, is a young hypertensive due to renal artery stenosis. He presents with five years history of transient ischemic attacks before he developed subarachnoid haemorrhage. Investigations revealed complete occlusions of both internal carotid arteries with collaterals via the ophthalmic artery and posterior communicating. Aneurysms either congenital or due to hypertension was probably responsible for his subarachnoid haemorrhage. Patient's hypertension was inadequately controlled, thereby accelerating the arteromatous process and aneurysmal formations. Hence the necessity for regular follow up and adequate control of hypertension.

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DISEASES ASSOCIATED WITH EXTREME ELEVATION OF ESR

A. ZULKIFLI, W.H. NG, PANIR CHELVAM & R.P. PILLAY

INTRODUCTION

ESR is a frequently ordered investigation. A normal ESR is reassuring but an elevated ESR may justify lengthy, costly laboratory and radiological investigations. Although extreme elevation of ESR (100mm/hr or more) may be alarming, it may not mean that a serious disease is present (Zacharski, 1966).

The sedimentation of cells depends on the downward force of the red corpuscles and the retarding forces of the plasma protein. Plasma constituents exert a more profound influence on ESR than do conditions of red cells. Fibrinogen is the single protein that influences ESR the most (Wintrobe, 1974). Elevations of the ESR are related to the reduction in the albumin: fibrinogen and globulin: fibrinogen ratios (Dintessfass and Steward, 1974).

This study analyses the disease conditions in this country that will cause an extreme elevation of the ESR (100 mm/hr. or above).

PATIENTS AND METHODS

All patients who were admitted between September 1977 to August 1978 into the Medical Unit I and Unit IV of General Hospital Kuala Lumpur had an ESR done routinely on them. The Westergreen method was used to determine the ESR. The test was performed, on venous blood collected in EDTA bottle, on the same morning. The degree of erythrocyte sedimentation was recorded after one hour. Patients with ESR greater than 100 mm/hr were studied in detail

and form the basis of this paper. The investigations include routine urine analysis, full blood picture with the relevant haematological indices, chest x-ray, cultures of the sputum and blood, liver function test, blood urea and serum electrolytes, L.E. cells. Where indicated, other investigations such as bone marrow examination, serum fibrinogen and platelet function test were done.

RESULTS AND DISCUSSION

53 patients had ESR of 100 mm or more over this study period. Of the 53, 27 were males and 26 were females. The age distribution is summarised in Table I. Ten of the patients (19%) were less than 20 years of age, 14 patients (16%) were over 50 years old. The rest were between 20 and 49 years of age. Of the 53 patients, 19 were Malays, 15 Chinese, 18 Indians and 1 Eurasian. The diagnoses are listed in Table II. In only three patients, the diagnosis was not established even after intensive investigations. This is comparable to other series (uireby and Leven, 1952, Zacharski and Kyles, 1966) of four percent and three percent respectively.

In 11 patients (19%) collagen disease was the cause. The experience of Zacharski (1966) was similar (17%). Infections (11%) and renal diseases (18%) cause a rise in the ESR similar to that found by others (Zacharski, 1966, Loren, 1952).

Table I

ESR 100 mm or more according to age groups

Age (years)	No. of Patients
0 — 9	2
10 — 19	8
20 — 29	15
30 — 39	7
40 — 49	7
50 — 59	7
60+	7
Total	53

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Table II

Diagnosis of 53 patients with ESR of 100 mm or more in one hour

Diagnosis	Number
Collagen/Rheumatic	11
SLE	2
Rheumatic Fever	4
Rheumatoid Arthritis	5
Renal	10
Nephrotic Syndrome	4
Chronic Renal Failure	4
Pyelonephritis	2
Haematology	9
Leukaemia	3
Myeloma	3
Aplastic Anaemia	2
Haemolytic Anaemia	1
Gastroenterologic	11
Chronic Diarrhoea	1
Cirrhosis of liver	4
Amoebic liver abscess	2
Alcoholic Hepatitis	2
Cholecystitis	1
Chronic Active Hepatitis	1
Infectious	7
Malaria	2
Tuberculosis	2
Subacute Bacterial Endocarditis	2
Typhoid	1
Others	2
Carcinoma cervix	1
Cardiac failure due to ischemic heart disease	1
Unknown	3

Haematological disorders account for about 15 per cent of patient in our series. On the other hand, in Zacharski's (1966) experience the percentage was double. In gastrointestinal and liver diseases, the percentage of patients with raised ESR in our series was twice as much as that found by Zacharski (1966). Just slightly more than ten percent of patients has ESR above 150 mm or more. The majority of patients,

Table III

Range of ESR value obtained in 53 patients

Value of ESR (mm Hg)	No. of Patients
100 — 109	8
110 — 119	16
120 — 129	15
130 — 139	5
140 — 149	2
150	7

the rise was between 110 mm to 129 mm (Table III). One surprising finding was that one patient with congestive cardiac failure due to ischemic heart disease had an ESR of 118. A report test showed it to be 109. No other cause was found despite extensive laboratory and radiological examinations as well as exhaustive clinical history and physical examinations. For most of our patients the diagnosis could be made on the basis of history, clinical examination, simple laboratory and radiological investigations which is normally available in most hospitals in the country.

SUMMARY

Fifty three patients with an ESR of 100 mm or more were detected from a year's list of admission to the medical wards. They were examined clinically and had laboratory and radiological tests done on them. The causes of the diseases were analysed and tabulated. No particular disease was found to have a particular range of ESP. One surprising fact was that a patient with congestive cardiac failure due to ischemic disease had a raised ESR. Most of the causes of raised ESR could be found clinically, supplemented by simple laboratory and radiological examinations.

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A STUDY OF ALLEGED RAPE CASES

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INTRODUCTION

MEDICO-LEGAL examination of alleged rape cases is often faced with trepidation by casualty doctors and gynaecologists. However, it is a duty essential to the carriage of justice for a serious offence.

A study was made of 45 alleged rape cases referred by the police to the University Hospital, Kuala Lumpur from January 1973 to June 1978, with emphasis on the medico-legal aspects of the problem.

MATERIALS AND METHOD:

All the records of alleged rape cases seen in the Accident and Emergency were reviewed. In the University Hospital all the victims were examined by the gynaecologist specialists who then have to fill the medical reports for the police. A thorough history and physical examination, including full pelvic examination, were undertaken. Vaginal swabs were taken in all cases for both microscopy and bacteriological culture. In all, 45 cases were seen during the period.

RESULTS:

Ethnic group of victim : There were 11 Chinese, 15 Malays, 18 Indians and one Eurasian. The number of Indians involved is proportionately higher than the ethnic composition of population around Kuala Lumpur. This was also found in a larger study of rape cases in Singapore (Sng and Ng, 1978) where the incidence rate per 100,000 female population was 35.8 for Indians, 24.5 for Malays and only 13.8 for Chinese.

AGE GROUP:

The victims were young, none of them was over 30 years old. Nineteen of them (42%) fall within the age group of statutory rape (14 years). In fact, 9 of them were less than 10 years old (Table I).

TABLE I

Age of victims of alleged rape

Age	No. of patients
less than 10 years	9
11 — 14 years	10
15 — 20 years	16
21 — 25 years	7
26 — 30 years	3
Total	45

MARITAL STATUS:

Only 7 were married and of this number only 3 were ever parous. Evidence of recent intercourse in virgins is more easily detected than in parous women.

OCCUPATION:

As 19 of the victims were children and below 15 years, only the occupation of other 26 were considered. Five were factory workers while another 5 were servants. Six others were still students while the rest were unemployed. In the Singapore study, the largest number were unemployed or were students.

PLACE OF THE INCIDENT: (Table II)

Twelve of the incidents reported occurred at home while 7 incidents occurred in the neighbouring house. Four occurred in a party. Seven incidents happened outdoors.

RELATIONSHIP OF ACCUSED: (Table III)

The majority were known to the victim: 5 were related, 8 were neighbours and another 8 were friends. Another 5 of the accused were "boy-friends". Ten were strangers while the accused was not mentioned in another 5 cases. Four of the accused had been alleged to rape 2 victims each. In some cases with boyfriends, consent was probably given but the girls were brought by their parents for examination.

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TABLE II
Place of incident of alleged rape

Place	No. of patients
At home	12
Neighbour's house	7
In a party	4
Outdoor	7
Others	5
Not mentioned	10
Total	45

TABLE III
Relationship of accused to victim

Relationship	No. of patients
Relative	5
Friend	8
Neighbour	8
Boyfriend	5
Stranger	10
Not mentioned	5
Total	41*

*4 of the accused had been alleged to rape 2 victims each

TABLE IV
Time when alleged rape was reported to police

Time	No. of patients
same day	17
1 — 3 days	7
4 — 7 days	3
more than 1 week	10
more than 1 month	8
Total	45

TABLE V
Physical injuries in alleged rape victims

Physical Injury	No. of patients
Body only	6
Vaginal only	11
Body & vaginal	3
No injury	25
Total	45

TABLE VI
Vaginal Injuries

Labial bruise/congestion	7
Hymen tears — recent	6
old	4
Tear in fourchette	1
(pregnant)	5
(intact hymen)	17
Total	40

TIME-LAPSE IN REPORTING:

The majority of the victims delayed in reporting the incident to the police. Twenty-eight of the victims reported after one day. In fact 10 delayed for more than 1 week and 8 only reported after more than a month's delay. (Table IV).

PHYSICAL INJURIES:

Of the 45 victims examined less than half (20) had evidence of physical injury (Table V). Fourteen sustained some trauma in the vaginal region, 11 of whom had no other injury while the other 3 had bodily injury as well. Six others had only bodily injury which were minor, consisting mainly of bruises and abrasions.

Out of the vaginal injuries, the most common were introital bruises or congestion which was found in 7 of the victims (Table VI). Fresh, hymen tears were seen in 6 victims and fairly recent tears occurred in another 4. One patient had a small tear in the fourchette as well. Five of the patients had evidence of pregnancy at the time of examination.

It must be pointed out that 17 (44.6%) out of the 38 unmarried victims had *intact* hymen at the time of examination for the alleged rape. In

the study in Singapore 36% of the alleged victims were found to be virgo intacta.

LABORATORY INVESTIGATIONS:

Although vaginal swab for microscopic examination is routinely done, only 5 specimens showed presence of spermatozoa.

None of the cultures revealed any growth of gonococci. In one study (Breen and Greenwald, 1976) 76 cases of gonorrhoea were found out of 2190 cases of alleged rape.

DISCUSSION:

The higher number of Indians affected may be due to the fact that they are more likely to report to the police compared to the Chinese. It is noted that the ethnic group of the accused was the same as that of the victims. The rarity of interracial rape is also noted in USA where they found that only 3% of rape cases was committed by black males on white females and 4% committed by white males on black females (Kellar, 1976).

Although it has been reported that rape can occur in any age, there seems to be greater likelihood in the young, including children. None of the victims in this study was over 30 years, only 22% of our cases were more than 20 years old while in the Singapore study (Sng and Ng, 1978) only 10% were older than 20 years. However it is not uncommon for older women to be raped (Kellar, 1976). The relatively high incidence of statutory rape (i.e. victims below 14 years old) was also noted in New York (Goldner, 1972).

As many of the victims were children, no record of the social class could be complete. However from those who are working, the victims fall mainly in the lower socio-economic class. This preponderance had also been noted in the USA (Amir, 1971). Many of the incidents occurred in familiar places such as the home or at a neighbouring house and committed by men familiar to the victims. A similar pattern is found in USA (Amir, 1971) and in Singapore (Ng, 1974). It is unfortunate that many of the cases are reported late by which time hardly any evidence could be detected. A higher number of the victims had some evidence of injury compared to the series reported by Ng (1974) in Singapore. None of them fortunately sustained any serious physical injury. It has often been claimed that it is impossible to

rape a grown woman without causing extensive injuries. However it has been pointed out (Rentoul and Smith, 1973) that the threat of death or bodily harm is enough to frighten women in submission. In Amir's study, 55% of the victims submitted. Surprisingly the more the non-physical force (e.g. intimidation, coercion) the more the submission. Children often submit unknowingly (Schiff 1969).

Since the slightest degree of penetration without emission constitutes the crime, no injury may be noted in many cases. Thus the medical examiner is not justified in affirming, because no physical evidence is elicited, that rape was not committed (Graiser, 1973). In this study no multiple rape i.e. rape by 2 or more offenders was found although rape on multiple victims was reported.

SUMMARY

A study of 45 alleged rape cases showed that many of the victims were young and from the lower socio-economic class. Many incidents occurred in familiar places and committed by men familiar to the victims. Seventeen (37%) of the victims reported on the same day. Less than half (44%) showed some physical injury, most of them minor. Seventeen had genital injuries but only six had recent hymenal tears. Only 5 vaginal swabs showed presence of spermatozoa.

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SELECTED BANDING TECHNIQUES IN THE IDENTIFICATION OF HUMAN CHROMOSOMES

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INTRODUCTION

Detailed analysis of the structure of normal and abnormal human chromosomes has advanced rapidly since the advent of the banding techniques, permitting successful identification of individual chromosomes (Paris Conference, 1971). Characteristic banding patterns have been shown along each metaphase chromosome though the biochemical basis for the staining reactions involved are still not clear.

Bands were first demonstrated in human chromosomes, using a fluorescent technique involving 'staining' with quinacrine mustard (Caspersson *et al.*, 1970). This was later replaced by a more easily available antimalarial drug, quinacrine dihydrochloride (atebrin). Such Q-bands are easily differentiated from G-bands produced by a non-fluorescent technique using Giemsa dye as a staining agent (Seabright, 1971). Another technique involving heat denaturation, results in a Giemsa staining banding pattern opposite to that obtained by the G-banding methods. This is referred to as the Reverse-staining Giemsa method, introduced by Dutrillaux and Lejeune (1971), resulting in R-bands. C-bands, unlike Q-, G- and R- bands, represent constitutive heterochromatin areas of human chromosomes located around the centromeres, secondary constrictions and the long arm of the Y chromosome. Routine C-banding procedures (Arrighi and Hsu, 1971; Sumner, 1972; Yunis *et al.*, 1971) have revealed considerable variability in the size of C-bands in the long arm of the Y chromosome and the centromeric regions of homologues of chromosome pairs 1, 9 and 16. For purposes of practical chromosomal identification, the C-banding technique is limited in demonstrating only certain segments of the genome. It is best used in combination with G-banding.

This article does not intend to review all the banding techniques introduced but to comment on the more useful ones relevant to chromosome identification in a routine diagnostic laboratory.

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RELEVANCE OF GOOD CHROMOSOME PREPARATIONS

A number of factors may influence the success of good banded preparations. What works well for one laboratory may not necessarily be applicable to another, unless the variable factors are standardised to a certain extent. The following salient points must be considered:-

Over-Contracted Chromosomes

To get a good number of metaphases, cell populations are usually treated with a mitosis arresting agent which inhibits spindle formation. The resulting metaphases, if too contracted, would band poorly. The right concentrations of colchicine or colcemide or velban in a short term 2-hour treatment prior to harvesting, should be sufficient.

Air-Dried Preparations

Though flame dried slides have been successfully banded in some laboratories; in the author's experience, air-dried specimens are preferred, invariably providing more superior banding preparations. Fixed cell suspensions should be dropped onto wet slides and air-dried.

Ageing of slides

Freshly prepared slides vary in their response to the different banding treatments. It is also true that very old slides do not band well. The author finds 3 to 10 day old slides, most often band consistently well with the different techniques.

CHOICE OF BANDING TECHNIQUES

A cytogeneticist has at his/her disposal, a wide range of banding techniques for chromosome identification. Any attempt here, at a detailed review encompassing most techniques would be futile. The choice of technique must depend on the type of study and the chromosomes to be analysed. Some techniques provide a good picture of the entire karyotype (G-, Q- & R- banding) while others may demonstrate only certain segments of the genome (C-banding).

Chromosomal anomalies, non-numerical in nature, cannot be easily identified by the conventional orcein or giemsa staining of the human karyotype. With good banded preparations, one can recognise and pinpoint chromosomes or chromosome segments involved. At least one banding technique must be applied for each karyotype study, and because of its simplicity, either the G- or R- banding techniques would be suitable. A sus-

pected chromosomal anomaly once demonstrated, can be further substantiated by other banding techniques eg. a translocation by centric fusion or pericentric inversion calls for C-banding and polymorphic Y chromosomes require Q or RFA (Reverse-staining method using fluorescence and acridine orange stain) banding.

Listed below are selected banding procedures with modifications successfully applied by the author. It is hoped that interested research workers can get good preparations. The original methods may involve several steps and are time consuming. Here, some steps are modified to get good clear bands in the shortest time possible.

G-Banding

For a routine karyotype analysis, G-banding is simple and most often gives good clear bands.

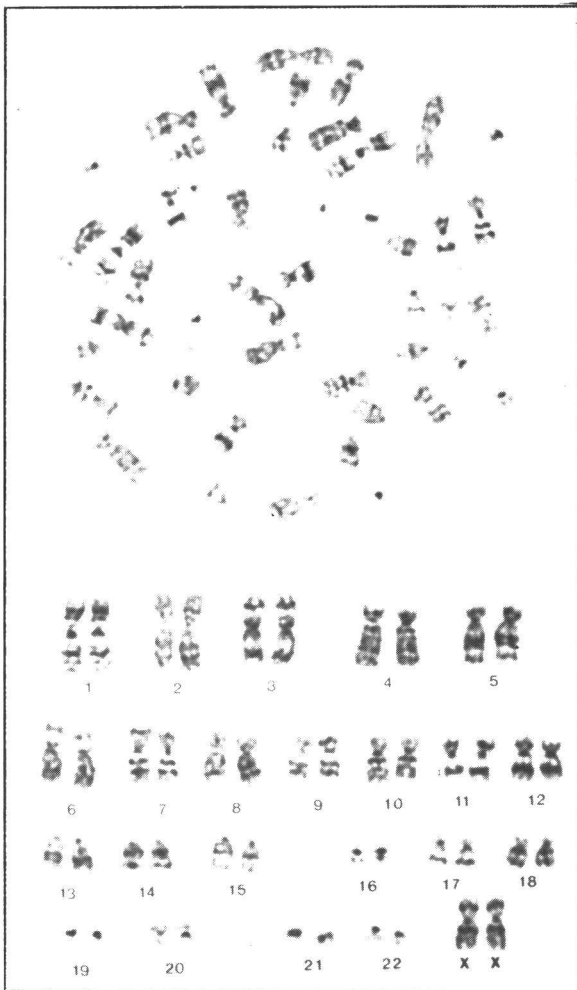


Fig. 1. Normal human female karyotype obtained from blood culture. Trypsin G-Banding.

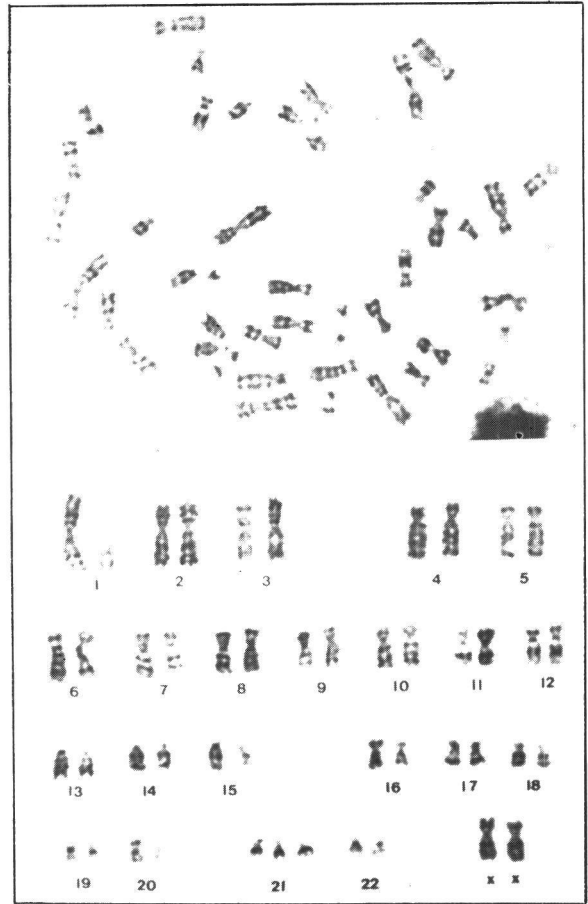


Fig. 2. Female trisomy 21 (Down's syndrome) karyotype with primay trisomy. Trypsin G-Banding.

Trypsin digestion is the preferred procedure. First, it is best to pretreat the slides with 2xSSC at 60°C for an hour. Some workers use hydrogen peroxide (H₂O₂) or no pretreatment at all. Slides are then to be flooded in 0.25% trypsin prepared in saline. Depending on laboratory temperatures, lower concentrations can be attempted. This trypsin step is important, each batch of slides can vary and be dependent on the different batches of trypsin used. Generally, a 30 second period of digestion with trypsin should be adequate. With practise, one can get good bands with the right timing. Slides should then washed at least twice before staining in 2% Giemsa for 10 minutes. Should the slides be underbanded, they can be flooded in trypsin for a variable time period, until bands produced are satisfactory (Fig. 1 & 2). All cell preparations were from cultures grown using RPMI 1640 and fetal calf serum. (Gibco)

In place of trypsin, a variety of chemicals can be used, even commercially available laboratory detergents eg. lipsol (Stephen, 1977).

C-Banding

Very often, it is advisable to counter check on the same specimen should the chromosomal anomalies involve the centromeric regions (e.g. centric translocations, pericentric inversions) or the length of the Y chromosome. A sequential analysis involving firstly G-banding, subsequently followed by C-banding would be useful in confirming the above. The modified BSG (Barium hydroxide/saline/giemsa) technique of Chandley and Fletcher (1973) can be performed on slides already G-banded. Slides first immersed in 0.2M HCl at room temperature for an hour, should be treated with 5% barium hydroxide at 60°C before being stained in 2% Giemsa for about 10 minutes. Fig. 3 shows chromosomes C-banded directly, the constitutive heterochromatin areas (i.e. C-bands) are highly polymorphic in chromosome pairs 1, 9 and 16 in this particular individual.

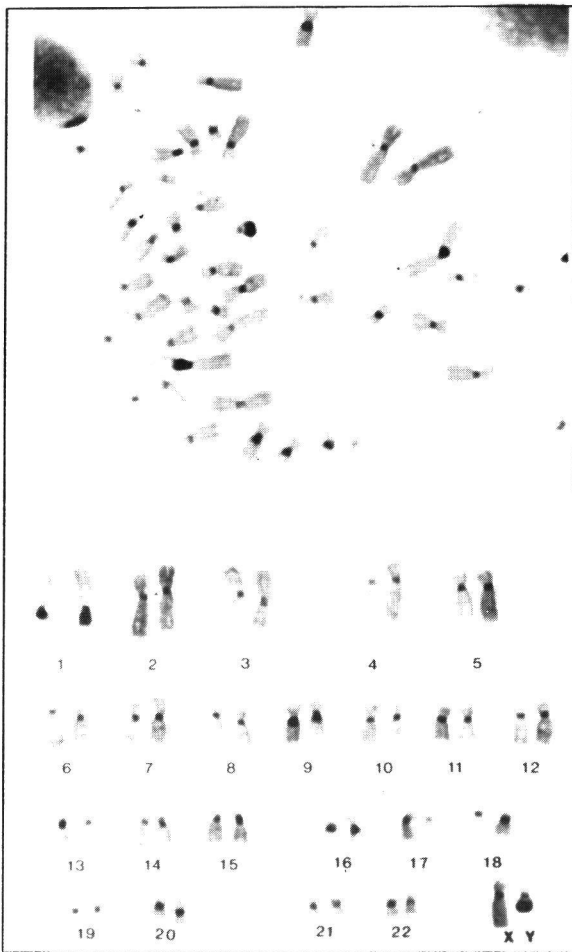


Fig. 3. Normal human male karyotype, C-banded with chromosome pairs 1, 9 and 16 highly polymorphic. Y chromosome distinctly C-banded.

R/RFA Banding

R-banding provides bands which are invariably opposite in staining intensity to G-bands though not as clear. Slides immersed in phosphate buffer, pH 6.5 at 85°C for 10 to 20 minutes could then be stained in 2% Giemsa. Heat denaturation in Earle's medium, pH 6.5 can be used instead of buffer (Dutrillaux, 1973).

Of late, a number of fluorescent techniques are available to produce R-banding patterns. Intensive yellow green fluorescence are observed at the sites of these R bands. Fluorescence procedures however, need microscopic accessories which may not be within the budget of some laboratories. In addition to technical difficulties, they are handicapped by rapid fading; hence preparations are not permanent, requiring photographic evidence to be taken immediately. Nevertheless, fluorescence techniques are superior in recognising chromosomes polymorphic for colour intensities and band sizes.

In differentiating such polymorphic chromosomes, the author finds the RFA technique of Verma and Lubs (1976) and Verma *et al.* (1977) superior to Q banding. This technique, using fluorescence is the same for ordinary R-banding, except that 0.01% acridine orange staining is used instead of giemsa. An 8 to 10 minutes staining should be sufficient. It is especially good for detecting fluorescence polymorphisms of human acrocentric chromosomes (chromosomes 13, 14 & 15 and chromosomes 21 & 22), clearly differentiated in terms of colour intensities and sizes of satellites stained.

RFA banding may be successfully applied to tracing the parental origin of the extra chromosome 21 in trisomy 21 (Down's syndrome) individuals (Yip, 1978). Fig 4 shows the karyotype of a trisomy 21 individual with the three chromosome 21s clearly polymorphic. Here, in this example, family studies were informative. The parental origin of the extra chromosome 21 could be determined since 2 of the 3 chromosome 21 variants were identically present in the mother, testifying to a maternal nondisjunctional error at meiosis. Also, the fact that these two chromosome 21s were dissimilar and not an identical duplicate of either one of the maternal chromosome 21s, pinpoints to a meiotic I error.

Q-Banding

This involves a simple fluorescence procedure, most useful for studying Y chromosome polymorphisms. Slides can be stained in 1% atebtrin (quinacrine dihydrochloride) for 5 to 10 minutes, washed with distilled water, temporarily mounted in phosphate buffer for observations under the fluorescence microscope.

In conclusion, considering the range of banding

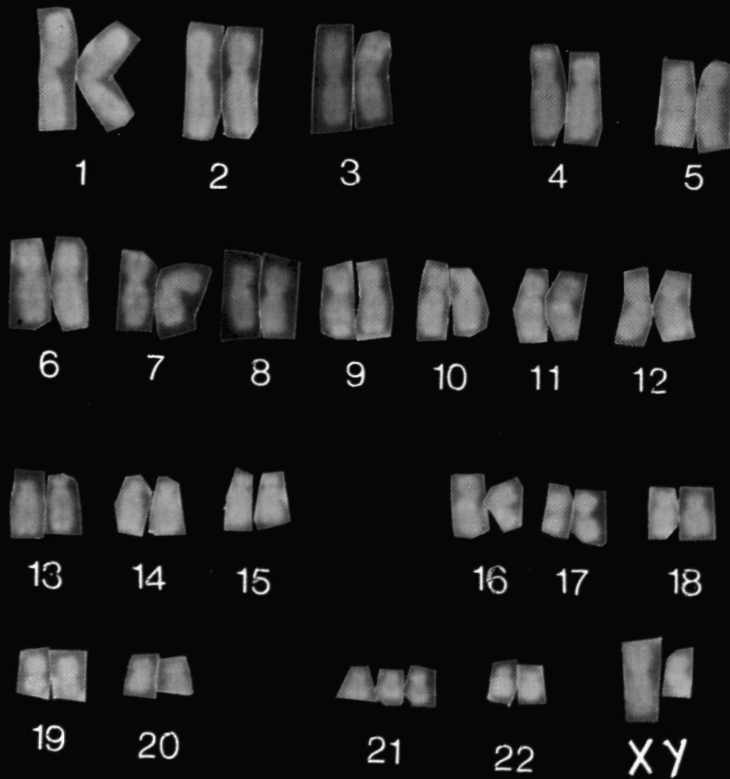
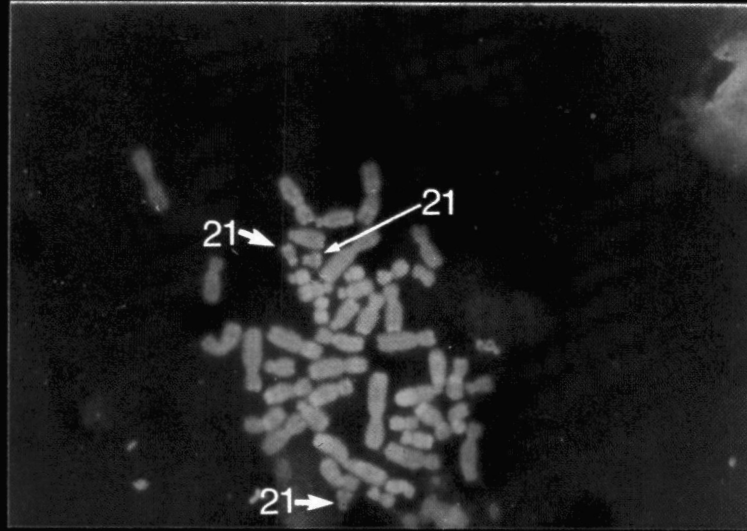


Fig. 4. Trisomic 21 cell and karyotype showing the three polymorphic chromosome 21s, varying in fluorescence intensities on both the short arms and the distal part of the long arm (RFA technique).

techniques available and its application to the understanding of chromosomal abnormalities prevalent in populations, the case for advocating the importance of chromosomal diagnostic laboratories need hardly be emphasized. The reliability of the new banding techniques has rendered simple morphological identification of human chromosomes inadequate. Laboratories have to decide as to which technique would be most suitable for their purpose. In that the Giemsa staining methods are highly reliable, requiring only bright-field microscopes and preparations permanent, research workers may have to use their discretion in combining a choice of other techniques when the need arises. Undoubtedly, the discovery of new banding techniques has provided useful tools for the recognition of breaks and rearrangements along chromosomes, confirmed many an established syndrome and is helping in the understanding of new ones.

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GENITAL INFECTIONS WITH CHLAMYDIA TRACHOMATIS

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INTRODUCTION

IN GENITOURINARY MEDICINE, the term "non-specific genital infection" (NSGI) refers to an inflammation of any part of the genital tract in which no established pathogen is easily detectable. The most studied form of NSGI is non-specific urethritis (NSU) in the male, which has increased in epidemic proportions in the past decade to overtake gonococcal urethritis to become the commonest notifiable sexually-transmitted disease in many countries today (Catterall, 1977). Results of extensive research into the aetiology of NSU indicate that *Chlamydia trachomatis*, an obligate intracellular parasite known to cause trachoma and a wide range of other ocular diseases, is probably the most important causative agent. From patients attending venereal disease clinics in England and USA, *C. trachomatis* was isolated from the urethra of about 40% of men with NSU (Dunlop *et al.* 1972, Oriel *et al.* 1972, Richmond *et al.* 1972, Holmes *et al.* 1975) and from about 30% of female contacts of these infected men (Oriel *et al.* 1972, Hilton *et al.* 1974). The mere isolation of *C. trachomatis* from patients does not prove that this organism is responsible for the clinical disease. However, the recovery rates from control men and women have been consistently low, around 0 to 7% (Oriel *et al.* 1972, Richmond *et al.* 1972, Schachter *et al.* 1975, Holmes *et al.* 1975). Antibodies to *C. trachomatis* are detected in patients with NSU much more often than in controls without NSU and seroconversion of specific immunoglobulin m antibody titres have been demonstrated by the

micro-immunofluorescence technique in recently acquired infections (Holmes *et al.* 1975). Clinical signs and symptoms often occur in patients from whom *C. trachomatis* is recovered. Dunlop *et al.* (1964, 1972) reported the presence of microfollicles and other changes in the marginal areas of the cervix and demonstrated papillary congestion and meatal follicles in the male urethra. Rees *et al.* (1977) studied female contacts of men with NSU and associated chlamydial infection of the cervix with hypertrophied erosion of the cervix and endocervical oedema, congestion and mucopus, all of which regressed after treatment with oxytetracycline. Experimental inoculation of *C. trachomatis* into the urethra of primates produced follicular lesions and provided further evidence that chlamydia can behave as a primary pathogen in the genital tract (Gale *et al.* 1977).

C. trachomatis has been isolated in the past with the use of embryonated hen's eggs, a rather laborious and time consuming method. Recent advances in tissue culture techniques for the culture of this agent have greatly facilitated studies on its role in infections of the genital tract. In May 1978, tissue culture techniques were set up in the Department of Medical Microbiology, University Hospital, Kuala Lumpur to isolate *C. trachomatis* from genital exudates. We report here some preliminary findings and describe the clinical histories of our first 3 chlamydia culture positive cases.

MATERIALS AND METHODS

Patients and specimens:

Outpatients from the University Hospital, Kuala Lumpur and two private clinics were examined. All male patients attended the clinics because they had symptoms of urethritis. Most female patients presented with vaginal discharge while 21 were referred for exclusion of sexually-transmitted diseases. From male patients, endo-urethral swabs were taken either with cotton-tipped wooden applicator stick swabs or with cotton-tipped wire swabs. Endocervical swabs were collected from female patients. After collection, swabs were broken into bijoux bottles containing 2 ml of Eagle's growth medium supplemented with 0.05 M glucose. These were then transported in wet ice to the laboratory for pro-

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Table I
Isolation rate of *Chlamydia trachomatis* from genital exudates

Specimen	No. of uncontaminated specimens	No. yielding chlamydia (%)
male urethral exudates	127	2 (1.6)
cervical exudates	70	3 (4.3)
Total	197	5 (2.5)

cessing. Specimens were either inoculated directly or kept frozen at -70°C until cell cultures were available.

Cell cultures:

McCoy cells for chlamydia isolation were kindly supplied by Dr. E.H. Sng, Department of Pathology, Singapore General Hospital. The techniques used for growing the McCoy cells and for the isolation of chlamydia were described by Reeve *et al.* (1975) but with minor modifications. The cells were grown in Eagle's minimal essential medium containing foetal calf serum 10% v/v, glutamine 1% of stock (30 mg/ml), amphotericin B 2.5 ug/ml and gentamicin 10 ug/ml. When confluent, the cells were trypsinised and then suspended in Eagle's growth medium containing 5-iodo 2' deoxyuridine (IUDR) 25 ug/ml to give a count of 10^5 cells/ml. 1 ml of this cell suspension was seeded into each of 5 ml, flat bottomed plastic tubes containing a 13 mm diameter coverslip. The tubes were used for chlamydia isolation after incubation at 37 C for 3 to 5 days when confluent growth was obtained.

Inoculation:

Each specimen was thoroughly mixed for a few seconds using a vortex mixer after which 1 ml of the specimen was inoculated into each of 2 tubes of idoxuridine-treated McCoy cells. The inoculum was centrifuged onto the cells at 3000 rpm in a MSE bench centrifuge at room temperature for 1 hour. The tubes were then incubated at 35°C for 48 — 72 hours after which the cells were fixed with methanol, stained with Giemsa and examined by darkfield illumination for characteristic intracytoplasmic inclusions of *C. trachomatis*.

Other examinations:

A separate specimen collected on a charcoal-impregnated swab was taken from each patient for the detection and isolation of other pathogens like *Trichomonas vaginalis*, *Candida albicans* and *Neisseria gonorrhoeae* by conventional methods.

RESULTS

Culture studies

A total of 243 specimens were examined out of which 46 were contaminated by bacteria. The 197 uncontaminated specimens consisted of 127 male urethral exudates and 70 cervical exudates. Out of these 197 specimens only 5 yielded chlamydia, thus giving an isolation rate of 2.5% (Table I).

Case reports

The 5 isolates of chlamydia came from 2 men and 3 women, all of whom had a history of either direct or indirect repeated exposure to sexually-transmitted diseases. *C. trachomatis* was the only pathogen isolated in 3 of the cases. One of the remaining 2 cases had concurrent *N. gonorrhoeae* infection and the other had *T. vaginalis* infection (Table II).

The lymphogranuloma venereum complement fixation test (LGVCFT) was done for 4 patients. Paired sera were obtained only from patient K.S.B. The first sample was taken about 2 weeks after onset of symptoms and the second, 6 weeks later. Both sera showed an antibody titre of 8. Low antibody titres of 4 and 8 were detected in 2 other patients. Detailed clinical histories of the first 3 cases are given below.

Table II
 Summary of clinical and laboratory data on 5 chlamydia culture positive cases

Patient	Presenting symptom	Age	Sex	Occupation	Past history of genital infection	Previous treatment for genital infection	Isolation of			Titre of LGVCFIT
							C.tr.	N.gon.	T.vag.	
M.R.	urethral discharge	35	M	Engineer	+	+	+	-	-	4
C.L.M.	low abdominal pain	23	F	Masseur	+	+	+	-	-	2
K.S.B.	vaginal discharge	NK	F	Housewife	NK	-	+	+	-	8,8
L.Y.L.	referred	15	F	Juvenile prostitute	NK	NK	+	-	+	8
T.M.C.	urethral discharge	46	M	Business man	NK	NK	+	-	-	ND

NK = not known

ND = not done

C.tr. = Chlamydia trachomatis

N.gon. = Neisseria gonorrhoeae

T.vag. = Trichomonas vaginalis

Case M.R.

The patient was a 35 year old engine who presented with a discharge per urethra 4 days after exposure in June 1978. On each of 2 visits to his general practitioner, he was given injection kanamycin and one week's supply of Vibramycin. This was because one month prior to this, he had had a similar episode of urethral discharge appearing 3 days after exposure (culture negative for *N. gonorrhoeae*) not responding to ampicillin and probenecid but responded to tetracycline hydrochloride. However, this time, the discharge persisted despite treatment with kanamycin and vibramycin. It was a painless, scanty discharge causing staining of underpants and noticeable only in the early morning. On his third visit he was found to have no abnormal clinical features except for a small amount of whitish urethral exudate produced on penile stripping. The exudate was collected on a swab for microscopy and culture. A direct smear examination showed about 5 plus cells per high power field and no Gram-negative diplococci. The urethral exudate yielded *C. trachomatis* and no other pathogen. The patient was treated with tetracycline hydrochloride 500 milligrams 6 hourly for 3 weeks. His symptoms were aborted and a repeat culture for chlamydia after 3 weeks was negative. Subsequently he was seen again after 2 months, 3 months and 6 months. On each occasion he complained of recurrence of urethral discharge but laboratory examination of his discharge showed no pus cells in the direct smear and no growth of pathogens. He was given further courses of tetracycline and is still being followed up.

Case C.L.M.

The patient was a 23 year old masseuse who, by nature of her profession, was prone to repeated sexually-transmitted infections. She resorted to giving herself daily douches with various antiseptic solutions and swallowing 1 to 2 capsules of antibiotics now and then at her own discretion. Only when her symptoms troubled her would she visit her doctor.

She was first seen in 1976 during which she was treated on several occasions for gonococcal and non-gonococcal pelvic inflammatory disease. In 1977 she was lost from follow-up but on 19th September 1978, she turned up again complaining of a low abdominal pain. On examination, she was found to have tender fallopian tubes and cervicitis. A direct smear examination of the mucopurulent cervical exudate revealed a large number of pus cells and a typical extra-cellular Gram-negative diplococci. A presumptive diagnosis of gonococcal salpingitis was made. After taking endocervical swabs for culture, the patient was treated with spectinomycin 2 grams intramuscular-

ly on 2 consecutive days and ampicillin 500 milligrams 8 hourly for 5 days. The cultures did not grow *N. gonorrhoeae* but yielded *C. trachomatis*. After 10 days, the patient returned with no more abdominal pain but complained of post-coital bleeding. On examination, her fallopian tubes were no longer tender but there were still signs of cervicitis. A repeat cervical smear showed no Gram-negative diplococci and a repeat culture was negative for both *N. gonorrhoeae* and *C. trachomatis*. However, based on the previous chlamydia positive culture report, the patient was treated with tetracycline 500 milligrams 8 hourly for one week. She was presumably rendered asymptomatic as she did not return for further treatment.

Case K.S.B.

The patient was a middle-aged housewife who was seen on 12th January 1979 with 2 weeks history of vaginal discharge. Her husband was a travelling salesman who admitted exposure and treatment by a private practitioner for urethral discharge. On examination, patient was found to have an endocervical polyp, a normal looking cervix with some thick, white cervical exudate. Intracellular Gram-negative diplococci were seen in a direct smear and endocervical cultures grew *C. trachomatis* and a B-lactamase-producing *N. gonorrhoeae*. She was treated with injection kanamycin for her gonorrhoeae and tetracycline 500 milligrams 6 hourly for 3 weeks to clear her chlamydial infection. Six weeks later, a repeat cultural examination was negative for chlamydia.

DISCUSSION

Although asymptomatic infections occur in both men and women (Schachter *et al.* 1975) it is generally accepted that *C. trachomatis* is a pathogen in the lower genital tract. However, not much is known about the full clinical spectrum of chlamydial genital infections. The isolation of the organism from cases of acute epididymitis and prostatitis (Harnisch *et al.* 1977) *acute salpingitis* (Mardh *et al.* 1977) and Reiter's disease (Vaughan-Jackson *et al.* 1972) suggests that, like *N. gonorrhoeae*, *C. trachomatis* may cause local or generalised complications.

Between 10 to 15% of men with NSU suffer frequent relapsing attacks (Catterall 1977). Patient M.R. apparently had several recurrences of NSU after a usual course of tetracycline. During these recurrences, chlamydial cultures were repeatedly negative. This is probably because, after antibiotic therapy, isolation is unlikely to be successful, yet the disease may still be active and liable to recur (Oriel *et al.* 1972). The fact that few or no pus cells were seen in the direct smears does not preclude a bacterial cause for the recurrences as polymorphonuclear cell counts are often nor-

mal in clinical cases. A more thorough investigation is necessary to exclude possible causes of relapses like structural abnormalities and residual infections in the prostate or paraurethral glands. However, some of the "recurrences" of this patient were likely to be reinfections as the patient did admit re-exposure on at least 1 occasion and his sex partner was never investigated or treated for chlamydial infection.

Patient C.L.M. had a history of repeated episodes of pelvic inflammatory disease. As no cultures for chlamydia were done on these occasions, it is not known whether *C. trachomatis* was associated with these infections. On 19th September 1978, she was culture-negative for *N. gonorrhoeae* but *gonorrhoeae* was still a possible concurrent diagnosis for her salpingitis as she improved symptomatically on spectinomycin and ampicillin. The negative culture and atypical extracellular Gram-negative diplococci in her direct smear could have been the result of taking sub-optimal antibiotics bought under the counter. In women, *C. trachomatis* very often occurs along with other sexually-transmitted pathogens, particularly with the gonococcus. Hilton *et al.* (1974), isolated chlamydia from 63% of women with gonorrhoea. They suggested that chlamydia gives rise to persistent but frequent quiescent infections in the genital tract in promiscuous females and that *N. gonorrhoeae* may reactivate these infections. This may well be the case in patient C.L.M. A repeat pre-tetracycline therapy culture from this patient failed to yield chlamydia but this may be just due to variability in specimen collection and processing.

The low complement fixation titres in our cases of chlamydial infection were not unexpected. The LGVCFT measures antibodies to a group antigen and has been found by several workers to be very insensitive for the diagnosis of chlamydial genital infections. Dunlop *et al.* (1972), examined the sera of 44 chlamydial culture positive men and obtained only 29.5% LGVCFT positives with the highest titre being 8. Out of 34 female contacts of these men, 11 were positive in the LGVCFT with a maximum titre of only 4. Oriel *et al.* (1972), also used the LGVCFT to examine sera from chlamydia culture positive NSU cases and found 38% with antibody titres of 16 or above.

Our 2.5 % isolation rate of chlamydia is probably an under estimation due to technical reasons or it may be partly due to lower rate of chlamydia infection in this region. In Singapore, a 5.5% isolation rate of chlamydia has been reported (Ministry of Health, Singapore, 1978). Our low isolation rate must not be compared with the 30 — 40% isolation rates reported in other studies because these higher percentages were mostly obtained from a high risk population

of men with NSU and their female contacts attending venereal disease clinics. Our study population is a mixed group of patients with genital discharges attending ordinary medical and gynaecological clinics and one venereal disease clinic. In many instances, the clinical diagnosis was not NSU or NSGI but just urethritis or vaginitis for investigation and which later turned out to be gonococcal, candidal or trichomonal infections as well as infections by other microbial agents. The detailed analysis of infective causes of lower genital tract pathology forms the substance of another report under preparation.

SUMMARY

Chlamydia trachomatis is isolated for the first time in Malaysia from patients with genital tract infections. Idoxuridine treated McCoy cells were used for culturing the organisms which were demonstrated by Giemsa staining. The first 3 of 5 culture positive cases are described to illustrate some clinical features associated with chlamydial genital infections.

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GROUP B STREPTOCOCCAL INFECTION IN THE NEWBORN

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INTRODUCTION

In recent years, group B streptococcus has emerged as an important cause of severe neonatal infection. Although precise documentation of an increased incidence of group B streptococcal infection in newborn is lacking, many neonatal units in the United States and Europe had experienced an increase in infection caused by this organism. Epidemiologic studies revealed an incidence of 2 per 1,000 live births and a mortality of 1 per 1,000 live births as being due to neonatal group B streptococcal infection (Franciosi *et al.*, 1973). In fact it ranked second only to *E. coli* as a cause of neonatal septicaemia and meningitis (Barton *et al.*, 1973; Baker *et al.*, 1973; Reid, 1975). There is no epidemiological data about this organism among pregnant women and newborns in this country and we believe the problem has not been recognised before.

This paper reports a case of neonatal group B streptococcal infection in Malaysia and discusses the epidemiology, clinical manifestations, treatment and the prevention of it.

CASE REPORT

Baby N.M., a full term 3.09 kg Malay girl, was born on 31st January, 1979 to a 23 years old years old mother, Gravida 2, Para 1, Abortion 1. The pregnancy and delivery was normal with ruptures of membranes 11 hours prior to the delivery. At 3 hours of age the infant was noted to have slight grunting with cyanosis and mild respiratory distress. Chest X-ray revealed mild reticular changes in both lung fields and was diagnosed as mild respiratory distress syndrome of newborn. The grunting persisted and by 24 hours of age, she developed low grade fever (rectal tem-

perature 38.4°C) and was noted to be lethargic, ill-looking with ashen grey colour of the skin. There was marked abdominal distension and bulging frontanelle. Laboratory investigations revealed Hb 12.5 gm%, Wbc 11,200/ul (68% neutrophils, 29% lymphocytes, 3% monocytes); lumbar CSF was turbid with 10,000 RBC/ul, 420 WBC/ul (14% neutrophils, 84% lymphocytes), protein 116 mg%, sugar 12 mg% and Gram-positive cocci was present. Ventricular CSF showed 180 RBC/ul, 1,500 WBC/ul., (99% neutrophils, 1% lymphocytes), sugar 5 mg%, protein 270 mg% and Gram-positive cocci also. The blood sugar was 90 mg%, serum bilirubin 8.4 mg%, serum electrolytes and blood urea were normal. Radial arterial blood Astrup showed pH 7.10, pCO₂ 40 mmHg, pO₂ 37 mmHg. She was diagnosed as neonatal septicaemia with pyogenic meningitis and was given oxygen, intravenous penicillin (200,000 units/kg/day) and intramuscular gentamycin (7.5 mg/kg/day). She also had three daily intraventricular instillations of gentamicin totalling 6 mg for the ventriculitis. The blood, CSF and ventricular fluid cultures all grew beta-haemolytic streptococci. Lancefield grouping was performed by using a rapid latex test kit (*Streptex*, Wellcome Reagents Ltd, England). All the 3 strains belonged to Lancefield Group B and subsequent typing of the strains by Streptococcus Reference Laboratory, London, found them to be type IIR. Group B Streptococci belonging to the same serotype was also isolated from the vagina of the mother. The patient was discharged well after 3½ weeks treatment and follow up 3 months later revealed a relatively normal child with no obvious neurological deficit.

COMMENTS

It is important to consider the diagnosis of B streptococcal infection in all neonates presenting with respiratory distress syndrome as the infection frequently manifests as such in the early stages. There should be minimum delay before the commencement of antibiotics as the morbidity and mortality is closely related to the timing of the treatment. (Alojipan and Andrew, 1975). Meningitis is also a frequent clinical manifestation of group B streptococcal infection and lumbar puncture should be routine in the "septic work-up" of these

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patients.

THE ORGANISM

Group B streptococci (*Streptococcus agalactiae*) were originally isolated from cows with mastitis and distinguished from group A streptococci by Lancefield in 1934. Infection in pregnancy and in the newborn was first described by Hood *et al.*, (1961); and subsequently Eickhoff *et al.* (1964) revealed that group B streptococci was the leading cause of neonatal sepsis at their hospital accounting for 25% of the cases. The organism is Gram-positive, arranged in chains and morphologically indistinguishable from other streptococci or the pneumococci. It produces a mucoid colony of 1-1.5 mm in diameter with a narrow zone of beta-haemolysis on sheep blood agar. Various laboratory tests, immunofluorescent and counterimmunoelectrophoresis techniques are available to distinguish group B streptococci from other streptococci (Edwards and Larson, 1973; Romero and Wilkinson, 1974). Immunochemically, they can be differentiated on the basis of their type-specific polysaccharides into types Ia, Ib, Ic, II and III.

EPIDEMIOLOGY

The epidemiology of group B streptococci is not well understood. The organism is widely distributed in humans as well as in cows and is found in the nasopharynx of asymptomatic carriers, the female genital tract, the rectum (the most common site) and the male urethra (Patterson and Hafeez, 1976). Due to differences in culture technique and site of swabbing, the vaginal carriage rate of group B streptococci among asymptomatic pregnant women varies from 4.6% to 29% (Franciosi *et al.*, 1973; Baker and Barrett, 1973, 1974; Reid, 1975; Schauf and Hlaing, 1976). However in the non-pregnant women of child-bearing age, the vaginal carriage rate is lower varying from 5% to 14% (Franciosi *et al.*, 1973; Monif, 1974). Not surprisingly, if the husbands of female carriers are examined, about half will have the organism in the urethra. More interestingly, nurses working in the nursery or obstretrical delivery suite appear to have a higher carriage rate than those in other parts of the hospital (Yow, 1975).

CLINICAL MANIFESTATIONS OF GROUP B STREPTOCOCCAL DISEASE

Maternal Disease

The vast majority of vaginal carriers of group B streptococci during pregnancy and puerperium are asymptomatic, but abortion is found to be more frequent among the carriers. Urinary tract infection, wound infection, puerperal sepsis, endocarditis, osteomyelitis and meningitis have also been described in the adult patients (Reid, 1975).

Neonatal infection

In recent years, beta-haemolytic group B streptococci has emerged as an important cause of neonatal septicaemia and in some studies is as common as Gram-negative infection (Howard and McCracken, 1974; Reid, 1975; Ablow *et al.*, 1976). Group B streptococcal infection is more common among the premature and low birth weight infants, after prolonged rupture of membranes, obstretrical manipulation and foetal asphyxia (Baker and Barrett, 1973, Lloyd and Baker, 1976). Although a significant number of pregnant women have group B streptococci in their vagina, only 1.9% of their infants are colonised and 0.27% of the infants showed signs of illness (Lloyd and Reid, 1976). The combined morbidity and mortality in their group of infants is estimated to be 50% (Horn *et al.*, 1974). The reasons why the carrier rate of group B streptococci in the pregnant women is so high and yet the rate of colonisation and infection in the neonates is so low, are not known. The low infection rate (0.78%) in the infant by his carrier mother is also observed with entero pathogenic E.coli (Lam, 1978).

Neonatal infections due to group B streptococci have been described into 2 main clinical syndromes based on the age of onset (early or late) and the types of infection (septicaemia or meningitis) (Table I).

Characteristic	Form of Disease	
	Early onset	Late onset
Time of onset	10 days	10 days-12 weeks
Obstetrical complications	+++	+
Prolonged rupture of membranes	+++	-
Clinical presentation	rapid onset, severe fulminating multi-systemic illness, with septicaemia, shock, pneumonia, apnoea and meningitis.	insidious onset, presenting with meningitis and septicaemia.
Mortality	58 - 71%	14 - 21%
Transmission	maternal genital tract (intra-partum)	Nosocomial (post-partum)
Isolation of organism from sites other than blood and CSF	86%	14%
Serotypes of streptococcus	variable (usually type Ia)	type III

Table I Neonatal group B streptococcal disease

Early Onset Disease

This occurs in approximately 2 to 3 infants per 1,000 live births and manifests within the first few hours of life as a rapid onset fulminating septicaemia with symptoms of respiratory distress and shock. It carries a high mortality of 58-71% in spite of treatment (Baker *et al.*, 1973). Baker (1978) reported that 60% of 58 infants with early onset group B streptococcal infection had symptoms within 12 hours of birth and apnoeic episodes were the most common initial signs observed. The other common clinical manifestations were pneumonia and meningitis. The early onset of pneumonia causing respiratory distress may so closely mimic hyaline membrane disease in both the radiological and clinical features that they may be indistinguishable (Albow *et al.*, 1974). However, associated high risk factors which favoured group B streptococcal infection may be present, namely, prolonged rupture of maternal membranes; chorioamnionitis manifesting as peripartum maternal fever and in the infant, early onset of apnoea, septicaemia, shock-like state and respiratory distress; presence of Gram-positive cocci and pus cells in the gastric aspirate and a positive high maternal vaginal swab for group B streptococci. The infection is acquired in utero from the aspiration of infected amniotic fluid or cervical secretions possibly as a result of micro or macroscopic rupture of membranes prior to labour with resultant extensive pulmonary infection at birth or possibly contamination by maternal faeces at birth (Baker, 1978). The pathogen can be cultured from multiple sites including the blood, cerebrospinal fluid, nasopharynx, skin and meconium of the infants.

Early onset disease can be caused by all subtypes of group B streptococcus but it is most commonly associated with type Ia but type III has also been isolated from one third of the cases. Type III is more frequently encountered in the late onset illness described below.

Late Onset Disease

The onset of the illness is usually insidious and most commonly presents as meningitis after 10 days of age but may occur as late as 12 weeks. The infants are not as severely ill as those with early onset disease. They have a lower mortality rate of 14-21% but the survivors frequently have neurological sequelae (Baker and Barrett, 1974). The pathogenesis of late onset disease is not fully established and is not associated with maternal infection or obstetrical complications. It has been suggested that the pathogens are acquired post partum from the mothers' or the infants' attendants. Virtually all

the infants have purulent meningitis and group B streptococcus type III is isolated in 90% of the cases (Franciosi *et al.*, 1973; Barton *et al.*, 1973).

TREATMENT

Early diagnosis is imperative especially in those with early onset disease because of the high mortality associated with group B streptococcal infection. As many of these infants present with respiratory distress it may be difficult to differentiate from hyaline membrane disease and the diagnosis may be missed. Thus, a high index of suspicion is necessary especially when clinical features and risk factors for group B streptococcal infection are present.

Intravenous penicillin is the drug of choice and ampicillin is the alternative. The dosage of penicillin is 150,000-250,000 units/kg per day and that of ampicillin 100-200 mg/kg/day (McCracken and Feldman, 1976). Penicillin is known to have a synergistic effect with the aminoglycosides (Schauf *et al.*, 1976). Combinations of penicillin or ampicillin with the aminoglycosides (kanamycin/gentamicin) are frequently used in the treatment especially when the possibility of Gram-negative infection cannot be excluded.

Supportive therapy with fresh whole blood transfusion, oxygen and ventilation are often indicated in the acute form illness. In the patient with purulent meningitis, it is important to do a ventricular tap to rule out ventriculitis which if present, should be aggressively treated with intraventricular chemotherapy (Lee *et al.*, 1977).

PREVENTION

Until an effective vaccine against group B streptococcal infection is developed, there is a need to examine other preventive measures against this serious neonatal infection which has a high mortality rate in spite of appropriate antimicrobial therapy. The various preventive methods advocating antimicrobial agents are still very controversial. The treatment with penicillin of all pregnant women colonized by this organism and their "positive" spouses had been suggested (McCracken, 1973, Franciosi *et al.*, 1973). The practicability of this method had been questioned as the number of infected infants are so small compared with the high incidence of vaginal carriers; besides, there is also a significant failure to eradicate maternal genital colonization on mucous membrane by antimicrobial drugs and infection may recur even after successful treatment. Recently, Yow *et al.*, (1979) recommended the screening of pregnant women at 34 to 36 weeks gestation in areas where group B streptococcal disease is prevalent and by treating

Others recommend a single dose of intramuscular procaine penicillin to the baby as it had been observed that this method given prophylactically to all newborns for prophylaxis against neonatal gonococcal ophthalmia have resulted in an absence of early onset group B streptococcal disease. This procedure must be evaluated with great caution as we do not know what it will do to the colonized newborns (Steigman *et al.*, 1975). It has also been suggested that prophylactic penicillin be given to all infants with respiratory distress at birth as it may not be possible to distinguish between hyaline membrane disease and group B streptococcal septicaemia (Miller, 1977). However, others have condemned the indiscriminate use of antimicrobial agents in respiratory distress syndrome of the newborn as the vast majority do not need them (McCracken, 1973). Recently, Lloyd *et al.*, (1979) reported a marked reduction in early onset neonatal group B streptococcal septicaemia in their nursery when they routinely administered 50,000-100,000 units crystalline penicillin/kg/day to all infants less than 2500 grams or less than 35 weeks gestation. Penicillin was given by 2 hours of age and was continued for 10 days if group B streptococci were isolated but was stopped at 48 hours if all cultures were negative.

These methods of prevention are impractical in this country as the facilities and resources are limited. We also do not advocate routine prophylactic antibiotics to all premature newborns with respiratory distress syndrome. However, in those infants at high risks for group B streptococcal disease and having respiratory distress, we recommend treatment with penicillin (100,000-200,000 units/kg/day) and kanamycin (15-20 mg/kg/day) after cultures are taken from the infant and the mother. The antibiotics are discontinued after a 5 days course if the cultures are negative and to continue for 10 days if group B streptococci or other organism are isolated.

It is also important to prevent cross infection in the hospital as nursing personnel and doctors have a colonisation rate of 15-43% (Yow, 1975). It is very easy to transmit organisms from one patient to another via the hands or our stethoscopes. Thus, routine hand washings with soap in between patients and disinfection of stethoscopes periodically are important preventive procedures. Other measures to prevent cross infection in the nursery are described elsewhere (Lam, 1978).

Finally, the future approach would be to immunise all females against the organism. Since type III accounts for the majority of all disease, immunogenic antigen derived from this organism have been prepared by Baker *et al.* (1978). Passive transfer of these antibodies to newborns should

protect the infant until 3 months of age. However further studies are needed to demonstrate the safety and immunogenicity of the vaccine in man.

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RELATIVE ABUNDANCE OF *Aedes aegypti* (LINNAEUS) AND *Aedes albopictus* (SKUSE) IN DIFFERENT HABITATS.

An Ovitrap Survey Conducted in Georgetown, Penang Island, Malaysia

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INTRODUCTION

Aedes aegypti (Linnaeus) and *Aedes albopictus* (Skuse) have been involved in the transmission of dengue haemorrhagic fever and classical dengue fever in many urban areas of South-east Asia (Smith, 1956; Hammon, 1966; Rudnick, 1967). On Penang Island, an ovitrap survey (Yap, 1975 b) conducted on the small towns and villages, excluding the City of Georgetown, indicated that *Ae. albopictus* was ubiquitous, where *Ae. aegypti* was present on the fringe areas adjacent to the City of Georgetown. Information concerning the biology of the two species of mosquitoes in the City of Georgetown is lacking.

The present investigation, concentrating on four selected areas within the City of Georgetown, is a study of the distribution and relative abundance of the two *Aedes* species with particular reference to different types of habitats and dwellings in the urban areas.

MATERIALS AND METHODS

The ovitrap technique (Jacob & Bevier, 1969) with its necessary modifications (Yap, 1975, a, b) was adopted to study the relative abundance of *Ae. aegypti* and *Ae. albopictus* in the urban areas of Georgetown on Penang Island. Four areas within the city limits of Georgetown were chosen for the study. These include: (1) Island Park—Green Lane area, which consists mainly of relatively new concrete double-storey residence houses built within the last 10-15 years, (2) Pulau Tikus—Burmah Road area, with mixture of old shophouses and new residence houses (3) Perak Road—East Jelutong area, with concrete and wooden shophouses lining Perak Road and wooden single-storey residence houses adjacent to

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the main road, and (4) McNair Street — Bridge Street area, which is the older part of Georgetown consists mainly of old, concrete double-storey shophouse-cum-residences. The first two areas are situated in the fringe of the city limits (Figure 1). Relative abundance of mosquitoes in shophouses versus residence houses (in Perak Road — East Jelutong area) and shophouse-cum-residences versus a school compound (in McNair Street — Bridge Street area) were also studied.

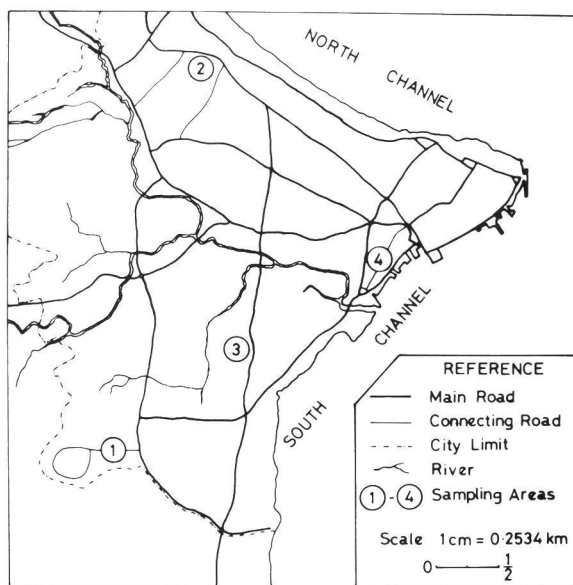


Fig. 1. Ovitrap sampling areas (No. 1-4) for *aegypti* and *Ae. albopictus* within the City of Georgetown, Penang Island, Malaysia.

The ovitrap used in the study consists of a drinking glass (rim diameters : 7.5 cm; height : 15 cm) coated outside with glossy black paint. A hardboard paddle (12.5 cm × 2 cm × 0.3 cm) was used as the oviposition substrate in each glass each half-filled with tap water. The ovitraps were arranged according to a grid system with distance of approximately thirty meters. The survey was conducted for a period of five weeks for each of the four designated areas. Ovitrap were set both 'indoor' and 'outdoor' for comparative studies. Procedures for

weekly servicing of the ovitraps, handling of exposed paddles, and identification of adult mosquitoes have been described earlier (Yap, 1975b).

Appropriate statistical analysis (e.g. standard errors and student — t tests) were done on the data collected with respect to the relative abundance of the mosquitoes at different habitats.

RESULTS

Results from the five-week ovitrap survey conducted at the four sampling areas within the

city of Georgetown (Figure 1) indicated that the oviposition rates of the two *Aedes* species were higher in areas 3 and 4 with mean numbers of 71.94 and 61.98 eggs per trap per week respectively (Table I). Percentages of ovitraps with positive egg deposition ranged from 54.25 (Area 1) to 79.42 (Area 2). Based on the identification of hatched mosquitoes both at the larval and the adult stages, Area 1 has the smallest percentage of *Ae. aegypti* present when compared with the other three areas (Table I).

Relative abundance of *Ae. aegypti* and *Ae.*

TABLE I: Ovitrap survey of *Ae. aegypti* and *Ae. albopictus* in four selected areas within the City of Georgetown, Penang Island. The survey was conducted over a period of five weeks.

	Sampling Area in Georgetown	Total No. of traps per week	Total No. of eggs collected	% trap with positive oviposition	No. of eggs per trap per week (Mean-S.E.)	% of <i>Ae. aegypti</i> from egg hatched
1.	Island Park — Green Lane	73	4,614	54.25	12.64 ± 3.42	1.20
2.	Pulau Tikus — Burmah Road	69	11,683	79.42	33.86 ± 4.21	9.58
3.	Perak Road — East Jelutong	30	10,791	79.34	71.94 ± 6.63	11.98
4.	McNair Street — Bridge Street	32	9,917	76.88	61.98 ± 6.24	15.76

TABLE II: Relative abundance of *Ae. aegypti* and *Ae. albopictus* at different habitats of Georgetown, Penang Island.

Week NO.	Mean No. of <i>Ae.</i> eggs/trap/week			
	McNair St. — Bridge St. Area (No. 4)		Perak Rd. — East Jelutong Area (No. 3)	
	School	Shophouses	Shophouses	Residence Houses
1	89.33	33.05	35.71	36.75
2	84.67	50.45	94.71	32.38
3	116.83	44.15	141.50	77.25
4	106.92	38.30	135.00	51.13
5	96.25	29.45	65.07	64.06
Overall Mean ± S.E.	98.80 ± 5.86	39.08 ± 3.77	94.40 ± 20.21	52.31 ± 8.37
t p value P = 0.05	6.8960 0.005 > P > 0.001 Highly significant		2.3915 0.10 > P > 0.05 Not significant	

TABLE III: Relative 'indoor' and 'outdoor' abundance of *Ae. aegypti* and *Ae. albopictus* based on the hatched mosquitoes from eggs collected in sampling areas 3 and 4.

Week No.	Mean No. of mosquitoes hatched/trap/week			
	<i>Ae. aegypti</i>		<i>Ae. albopictus</i>	
	indoor	outdoor	indoor	outdoor
1	3.38	6.43	8.88	20.83
2	7.91	12.10	16.16	28.50
3	11.50	12.17	23.38	42.37
4	17.75	8.20	40.66	35.20
5	6.69	5.67	17.25	28.10
Overall Mean \pm S.E.	9.45 \pm 2.45	8.91 \pm 1.38	21.27 \pm 9.18	31.00 \pm 3.64
t P value P = 0.05	0.2180 P > 0.10 Not significant		2.4025 0.10 > P > 0.05 Not significant	

albopictus under different habitats were studied in areas 3 and 4. In area 4 (McNair Street — Bridge Street area), when comparisons were made between a school compound and adjacent old concrete shophouses-cum-residences, the mosquito population were definitely higher in the school compound (Table II). Comparison of shophouses versus residence houses in area 3 gave mean values of oviposition of 94.40 and 52.31 respectively. However, due to variability of the weekly results, the differences were not significant at 95% confidence level (Table II). Similarly, comparison of oviposition rates with ovitraps situated 'indoor' versus 'outdoor' (definitions see Yap, 1975b) in areas 3 and 4 gave no significant differences (Table III).

Hatching of *Aedes* eggs collected from individual ovitrap gave the following additional information concerning the biology of the two *Aedes* species: (1) Overall hatching rate of the eggs collected for the five week period was 54.27%, (2) Sex ratios of the mosquitoes hatched were very close to 1. Male mosquitoes constituted 49.55 and 49.46% of the total population for *Ae. aegypti* and *Ae. albopictus* respectively, (3) Sharing (cohabitation) of ovitraps by the two *Aedes* species appeared to be common. Percentage of positive ovitraps with both *Ae. aegypti* and *Ae. albopictus* present were 55.4%, and (4) In area where *Ae. aegypti* population was low (as was found in Area 1), the mosquitoes were consistently found in only a few ovitraps from the same spots over the survey period.

Throughout the five week survey, missing paddles from ovitraps and missing or broken ovitraps represent 7.40 and 2.10% of the total ovitraps used respectively.

DISCUSSION

Results from the ovitrap survey in Georgetown indicated that the *Aedes* mosquitoes studied were more abundant in the crowded poorer central districts of the City (Table I; Figure 1, areas 3 and 4). These areas consisted of slum houses as well as old concrete houses with poor sanitation facilities. The ovitrap survey also demonstrated that *Aedes* density were significantly higher in a school compound when compared with the adjacent shophouses (Table II). Although the survey is of a preliminary nature only, the implication that schools, with the possibility of a higher mosquito population as indicated here, can serve as a focus for the transmission of dengue and dengue haemorrhagic fever among young children cannot be neglected.

Results obtained from hatching *Aedes* eggs collected from ovitraps gave no significant differences concerning the 'indoor' and 'outdoor' distributions of the two *Aedes* mosquitoes (Table III). The findings are in contradiction to the results obtained from the conventional larval inspection method in Singapore City (Chan, *et al.*, 1971a) and the whole island ovitrap survey conducted on Penang Island (Yap, 1975b). The discrepancy in the two ovitraps surveys may be due to the fact that in the present survey 'in-

door' vs 'outdoor' ratios were calculated from the hatched mosquitoes from eggs collected, whereas, in the whole island survey, comparisons were based on the total number of eggs collected.

Extensive surveys of the larval habitats in Singapore City (Chan, *et al.*, 1971b) showed that the sharing of natural breeding habitats by the two *Aedes* species was uncommon (7.1% of total number of breeding habitats). In contrast, the present survey indicated extensive sharing of ovitraps (55.40% of total positive ovitraps) by *Ae. aegypti* and *Ae. albopictus*.

In the Island Park — Green Lane area (figure 1, Area 1), *Ae. aegypti* constituted only 1.20% of the total *Aedes* hatched from the eggs collected. This *Ae. aegypti* population was obtained consistently from a few ovitraps set in the same spots over the period of time studied. This lack of movement for oviposition may be related to the limited dispersal ability of the species in the field (Morlan & Hayes, 1958; Schoof, 1967).

The present survey and the whole island survey conducted earlier (Yap, 1975b) indicated that ovitrap technique can be an effective, inexpensive sampling device for studying distribution of *Ae. aegypti* and *Ae. albopictus* in suburban as well as urban areas. The technique can be considered complementary to the conventional larval inspection method, especially in situations, where field experimentations are needed in order to obtain additional information concerning the bionomics of *Aedes* species in the field in relation to the transmission of dengue and dengue haemorrhagic fever in endemic areas.

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REPRODUCTION RESEARCH AND HEALTH

PART I MATERNAL HEALTH

T.A. SINNATHURAY

INTRODUCTION

Some 30 years ago in 1948, when the World Health Organisation was inaugurated in Geneva, Switzerland, a broad concept of "HEALTH" was innu-nciated as follows:

"Health is a state of physical, mental and social well-being, and not merely the absence of disease and infirmity". Whilst the "physical" aspects of health are overtly apparent to all of us, the "men- tal" aspects of health are less, and the "social" aspects to a still lesser extent appreciated by many of us. However, in the present day context of health care, the latter two aspects have assumed as im- portant a role in human well being and human wel- fare, as the "physical" aspects of health or ill- health. When reviewed from an evolutionary view- point, the health care trends in the 20th century display distinct patterns, in that the first two quarters of this century have been directed at at- taining optimal levels of the "physical" aspects of human health; and in the third quarter of this century has emerged the awareness of "mental", and more recently "social" aspects of health and well- being. As we now enter the last quarter of this cen- tury, tremendous strides are being directed to- wards achieving total health and well-being.

If we now apply these broad changing concepts of HEALTH to the special field of human repro- duction, the changes witnessed in the 20th century, thus far, are phenomenal.

Exactly two decades ago, in 1959, an eminent reproductive scientist, Dr. Zuckerman, summed up the deliberations of the first large-scale inter- national conference on Human Reproductive Physiology and Fertility Regulation in these words: "Vast areas of the subject are still cloaked in an ig-

norance which prevents a national and scientific approach to the problem of population control ... The subject.... is still littered with legends (p. 1263)". However, the ensuing two decades (1959- 1979) have witnessed considerable strides in all aspects of RESEARCH in the fundamental sciences of human reproduction and contraceptive technology, which have been primarily stimulated by the mounting concern over rapid population growth, in most countries of the world, particularly in the developing countries of South America, Africa and in our context, Asia, of which Malaysia and its Asean members are typical examples. Re- searchers and research institutions, in both the developed and developing nations have, each in their own ways, contributed to an extensive wealth of basic knowledge in the biochemistry, physiology, pharmacology, pathology and bacteriology of human reproduction. Further, epidemiological and sociological studies in the field of human re- production of communities in different parts of the world have led to a better understanding of MAN and WOMAN in their reproductive roles, and such studies have laid to rest many of the mis- conceived traditional legends and practices; thus helping to elucidate many of the longstand- ing problems in the field of human reproduction. The currently ongoing world-wide researches in the field of human reproduction give considerable hope and encouragement towards the realisation of developing, on an international and scientific basis, improved means of regulating human reproduction in this last quarter of the 20th century, and into the foreseeable future. These are, in fact, the principal conclusions of the intensive "Review of the Reproductive Sciences and Contraceptive Development", initiated in 1974 by the Ford Foundation, with the partici- pation of the Rockefeller Foundation of New York, U.S.A. and the International Development Re- search Centre (I.D.R.C.) of Ottawa, Canada (Greep *et al.*, 1976).

The fundamental difference between the "health care" provided by the obstetrician to his patient and that by other medical practitioners to their patients is that the obstetrician has always to keep in consideration the health and well-being of

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at least TWO LIVES in every one of his obstetric patients — the mother and the unborn child. (In the case of multiple pregnancies, there are obviously more than 2 lives in each patient!). It is, therefore, all the more important that the obstetrician should always temper the management of his patient by rigidly adhering to the concept of "Primum Non-Nocere" for both the mother as well as for the unborn child.

Having crystallised the inter-relationships between Reproduction, Research and Health, it is my intention to present to you, what I consider to be, the four important and major areas of Human Reproduction and Health, and to show to you the health benefits attained by research. The four areas are:-

- 1) Maternal (Mother) Health (Part I)
- 2) Fetal (Child) Health (Part II) (To be published in the next issue)
- 3) Fertility Regulation (Family Planning) (Part III) (To be published in issue after next)
- 4) Fertility Augmentation (Infertility Management)

MATERNAL HEALTH

Looking back some 50 years ago, in the late 1920s, in the maternity hospitals of the Asian regions, some 3% (1 in 35) of women admitted in labour, died from childbirths; and, of course, numerically much more maternal deaths occurred amongst mothers delivering outside the hospital precincts! Such a pattern also prevailed, at that time, in the more developed western countries. Thus, Emeritus Professor Sir Dugald Baird of Aberdeen University, in his Ingleby Address to Birmingham University in 1960 entitled "The Evolution of Modern Obstetrics" (Baird, 1960), stated as follows: "Out of 19,000 women admitted to the Glasgow Maternity Hospital between 1925 and 1929, 542 died, (maternal case-mortality of 2.9%). Eclampsia occurred in 395 cases, with a maternal case-mortality of 18%. There were 226 deliveries following craniotomy, and 11% of the mothers died". It was, thus, apparent that childbirth in those days was a dangerous and wasteful process!

The three major sociological reasons for the excessive maternal mortality in the past (50 years ago) were: (1) Poverty, resulting in the mother having to weather her entire pregnancy status in a sub-optimal state of health, with reference to nutrition, physical rest and inter-current infections; (2) Ignorance (on the part of the mother and medical attendant) of the causes of many of the serious complications of pregnancy and labour, and the inadequacy of the methods of treatment available;

and (3) The lack of well-organised maternity services, staffed by well-trained medical personnel, which includes not only the doctor but also a host of other health personnel, such as nurses, midwives, laboratory technologists, medical social workers, dieticians, health visitors, radiographers and includes even the provision of an efficiently manned ambulance service to cover the "Flying Squad" service. This last service has been shown to play a significant role in salvaging many maternal deaths, by providing on-the-spot emergency treatment to critically ill and moribund mothers at their bedside, in their homes or in maternity clinics.

It is now pertinent to consider the five major causes of maternal mortality, and to review the impact that research and evolution of modern obstetric practice has had on them. The five major causes are: (1) infection (puerperal sepsis); (2) haemorrhage; (3) hypertensive disease of pregnancy (toxaemia of pregnancy); (4) difficult labour (dystocia); and (5) illegal abortion (criminal abortion).

1. Infection (Puerperal Sepsis)

Some 50 years ago, the most important cause of maternal deaths was puerperal sepsis. The situation as it prevailed then, was aptly described by Sir Dugald Baird (1960) as follows: "Even after a labour that had been entirely normal, a rigor on the second or third day, accompanied by a sudden rise of temperature and pulse, could mean death within a week from septicaemia and peritonitis. The clinical features were well known to the women themselves and to the handymen in attendance. The medical profession was very reluctant to admit that the doctor or midwife was often the carrier of the streptococcus and indeed sometimes the primary source of infection".

Prior to 1935, bacteriological research on the identification and typing of streptococci had made it possible to identify without doubt the source and mode of spread of the organism responsible for most causes of puerperal sepsis. This had led to the identification, control and treatment of the bacterial carriers amongst nurses, doctors, medical students, visitors and others. It also led to the use of masks, and the immediate isolation of infected cases. This was also the explicit reason for the siting of maternity hospitals and units, and, in particular, the postnatal (lying-in) wards, well away from other hospital units. Although these measures led to some decrease in the incidence of streptococcal sepsis, it was difficult to get them carried out really effectively (Baird, 1960).

The advent of the sulphonamides in the late 1930s, the penicillins in the 1940s, and large host

of bacteriostatic and bactericidal chemotherapeutic agents in the past 25 years, have all helped, in one way or another, to provide an effective spectrum of armamentaria in the prevention and treatment of not only puerperal sepsis, but also other infections in the pregnant and puerperal mother.

“The rise in the incidence of drug-resistant organisms in most maternity hospitals in recent years has not, so far, increased the maternal death-rate from sepsis; but it has underlined the need to practise the principles of isolation and barrier nursing if maternity hospitals are to be kept safe for the mother and more especially for the newborn child. In the overcrowded and under-staffed hospitals of today we have come to rely too much, (and I repeat “too much”), on chemotherapy. The need to design hospitals so that the risk of sepsis is reduced to a minimum is as important as ever it was. It would be most unfortunate if outbreaks of sepsis should curb the work of our maternity hospitals at a time when they are capable of doing so much for the safety and comfort of the mother and baby” (Baird, 1960).

In summary, the major factors that have, in recent years, contributed towards the reduction of maternal deaths from infection in pregnancy, including puerperal sepsis, are: (a) the practice of asepsis and antisepsis; (b) research advances in the bacteriology of puerperal infections; (c) the advent of broad spectrum of chemotherapy; (d) improved maternal nutritional status; (e) the avoidance of prolonged and difficult labours; and (f) the improved designing of hospitals (Baird, 1960)

2. Haemorrhage

Haemorrhage is still a major cause of maternal deaths, especially when the delivery takes place outside the precincts of well-equipped maternity units. Such a situation is more likely to arise in developing countries and more so in a rural than in an urban set-up. It is thus immediately apparent (to all of you) that the Malaysian mother runs a very much higher risk of maternal death from haemorrhage than does her counterpart in Stockholm, Sweden or even in neighbouring Singapore.

Reductions of maternal deaths from haemorrhage in the past 25 years have been phenomenal, and have been attained by an interplay of multiple health-benefit measures, both of preventive and of curative nature, and these are: (a) the reduction of grande-multiparity by effective family planning and health education; (b) the improved maternal nutritional status by socio-economic enhancement and health education of the community; (c) the reduction of severity of pregnancy toxæmia by improved obstetric care; (d) the institution of blood transfusion service; (e)

hospital delivery for the high-risk mother; (f) the avoidance of prolonged and difficult labours; (g) the institution of “Flying-Squad” service; (h) the availability of potent oxytocics in the prevention and treatment of atonic post-partum haemorrhage; and (i) the recognition and treatment of blood coagulation disorders in pregnancy.

3. Hypertensive Disease of Pregnancy (Toxaemia of Pregnancy)

This condition is peculiar to pregnancy status and is often referred to as “toxaemia of pregnancy”. Although a common complication of pregnancy, afflicting some 10 to 20% of all pregnant women at some stage of their pregnancy, it is still a disease condition, whose aetiology is unclear and enshrouded with numerous theories.

This disease condition continues to be a major cause of both maternal and fetal mortality and morbidity, especially in the developing countries of the world. In its severest form, it causes maternal death from eclampsia (fits), accidental haemorrhage, and less frequently from renal failure, intracranial (cerebral) haemorrhage and acute heart failure.

Although the onset of the disease cannot be prevented in view of its still obscure aetiology, the progress of the disease condition, from its relatively innocuous mild pre-eclampsia to the hazardous severe pre-eclampsia and eclampsia, can usually be contained by a number of innovative preventive and curative health measures, and these are :- (a) the early case-finding—role of health education, use of nurse-midwives and other medical auxiliaries in ante-natal care; (b) comprehensive ante-natal care—both outpatient and inpatient services are important; (c) bed rest—at home or hospital; (d) the use of sedation—to achieve ideal bed rest; (e) the use of hypotensive agents; (f) the planned induction of labour and conduction of delivery; and (g) the intensive care in eclampsia.

Of all the measures that have been detailed, the single most valuable measure in reducing the risks of maternal deaths from hypertensive disease of pregnancy is early case-finding by comprehensive ante-natal care. Presently, I serve as a member of a World Health Organisation Steering Committee (of 6) on Pregnancy Toxaemia, and we are engaged in the task of planning operational research programmes to evaluate the prevalent rates of this disease condition in developing countries, as well as to determine how best the medical personnel of the non-doctor grade, i.e. the nurse-midwives and even the traditional

birth attendants, could be enrolled to help in early case-finding of this condition, and thereby hope to minimise the occurrence of the disease condition in its fatal forms (W.H.O. MCH/78.2 and Sinnathuray, 1977, WHO MCH/TP/77.11).

4. Difficult Labour (Dystocia)

Until some 40 years ago, maternal deaths from difficult and prolonged labours were relatively frequent occurrences, especially in the less developed countries of the world. As a result of the difficult and prolonged labours, the mothers died from a multiplicity of causes, and these were the sequelae of haemorrhage and shock from ruptured uterus, infection in the form of septicaemia or peritonitis, or a combination of haemorrhage, dehydration and septicaemia. The difficult labours were most frequently due to cephalo-pelvic disproportion (disproportion between the small maternal pelvic cavity and relatively large fetal head); less frequently this was due to obstructed labour from neglected fetal malpresentation; and least frequently to uterine dysfunction in labour.

The health measures that have contributed towards the significant reduction of maternal mortality in difficult labours in recent decades are:- (a) the improved health and physique of mothers and would-be mothers — due essentially to socio-economic upliftment of the community (Baird, 1960); (b) the avoidance of difficult vaginal deliveries (Baird, 1960); (c) the liberal use of caesarean sections — and here we have seen the evolution from classical caesarean section of the Julius Caesar era to extraperitoneal lower segment caesarean section, to the present practice of transperitoneal lower segment caesarean section; (d) the advent of blood transfusion services; (e) the advent of antibiotics; and (f) the better understanding of fluid and electrolyte imbalance in labour.

5. Illegal Abortions (Criminal Abortions)

Pregnancy is an interesting sociological situation that human beings can find themselves in. A planned pregnancy is always jubilantly looked forward to. Whilst most women accept their pregnancy situations philosophically once they have occurred; there are always some women at some stage of their reproductive life, who are unhappy and distressed on finding themselves to be pregnant. In this latter group, there are many who may still, reluctantly, go through with their pregnancies, especially if there are strong religious or socio-cultural deterrents towards resorting to induced abortions; but, there will always be some women at some stage of their life in every community, who will be determined to procure an induced abortion to rid themselves of an unwanted pregnancy.

The practise of illegal (criminal) abortion, either for the regulation of human fertility or for other social reasons, has been in existence since time immemorial. As we now enter the fourth quarter of the 20th century, the common preventable causes of maternal mortality and morbidity, such as maternal infections (puerperal sepsis), haemorrhage, hypertensive disease of pregnancy (toxaemia of pregnancy) and difficult labour (dystocia) are being effectively reduced by rapidly improving standards of obstetric care. In contrast, abortions, in particular, illegal abortions, also referred to as criminal or clandestine abortions, are emerging as a major cause of maternal ill-health, contributing to both maternal mortality and morbidity. As I have always stated to my professional colleagues, the extent of the health hazards of illegal abortion to the mother can best be portrayed by the "iceberg" analogy. In any given environment, the maternal mortality hazards of illegal abortion are invariably represented by the more apparent "tip of the iceberg" above the water level; in contrast, the much larger problem of maternal ill-health (morbidity) arising from illegal abortion, comes to be represented by the larger "hidden component of the iceberg" below the water level. Put in another way, for every maternal death, arising from an illegal abortion, there must be a relatively large number of other women going through life with varying degrees of ill-health, from which they never fully recover.

The health hazards to the mother from illegal abortion have reached such proportions recently, throughout the world, that the World Health Organisation (W.H.O.) has initiated a W.H.O. Task Force (1974) and a W.H.O. Scientific Group (1978) to study the problem. It has been my privilege to serve as a member of the W.H.O. Task Force on Illegal Abortion, since its inauguration five years ago in 1974. Through the activities of the W.H.O. Task Force, my department is collaborating with three other world centres, namely Ankhra in Turkey, Lagos in Nigeria and Caracas in Venezuela, to evaluate the health hazards and cost-implications, sustained by women admitted to hospitals with induced abortions. The first phase of our collaborative study is due for completion very soon. Prior to the present W.H.O. Study, between 1973-1977, I was privileged to direct a major socio-medical field survey on the problem of illegal induced abortion in Peninsular Malaysia. This latter study was financed by the International Development Research Centre (I.D.R.C.) of Ottawa, Canada to a generous sum of Canadian \$92,000/-, and the project was locally sponsored by the Fede-

ration of Family Planning Associations (F.F.P.A.) of Malaysia. My research team consisted of an inter-disciplinary group of scientists in the fields of obstetrics and gynaecology, social and preventive medicine and demography, drawn from different sectors of the nation's public services.

The study group undertook a well-planned, retrospective, community-based, interview-type of study on 9,506 eligible respondents (ever married females, aged 15-44 years) that were found on screening 13,704 households in selected three urban and five rural areas. This study yielded, for the first time, extensive and intimate data on the reproductive, contraceptive and abortion, in particular illegal abortion, behaviour patterns of both urban and rural Malaysians of the three major community groups, i.e. Malays, Chinese and Indians. It is quite impossible for me to give you extensive details of our findings. Suffice it to say, that the highlights of our survey findings have been published in a 166 paged joint FFPA-IDRC document, entitled, "Report on Maternal Health and Early Pregnancy Wastage in Peninsular Malaysia" (Sinnathuray *et al.*, 1977); and further, a major Guest Lecture, incorporating some of the findings, was presented by me at the Triennial International Union for the Scientific Study of Population (I.U.S.S.P.) and at the VIIth Asian Congress of Obstetrics & Gynaecology in Bangkok in November 1977 (Sinnathuray, 1977). However, much of the data is still unpublished.

In brief, our survey showed that 10.78% of all women interviewed (9,506) reported having experience one or more induced abortion during their life time, and induced abortions occurred to the extent of 3.9 per 100 pregnancies or 4.3 per 100 live-births. The practice of induced abortions were more frequent by the urban residents and Chinese community group and least by rural residents and Malay community group. The major reasons given for undergoing an induced abortion were *firstly* "family planning" (both family spacing and family limitation) and *secondly* "socio-economic" (financial difficulties). Those of us, who would wish further data on this important topic can readily obtain a copy of the Report from the Federation of Family Planning Associations, Malaysia.

It is, therefore, now accepted that the whole question of illegal abortion with its risks to maternal health is not a straight-forward medical (gynaecological) ailment, but is a more extensive social disease. Hence, any health programme aimed at alleviating the health hazards of illegal abortion to the mother should take into consideration the provision of not only health education against the practice of illegal abortion, prompt curative medical care and psycho-social rehabilitation; but also

offer alternative and effective non-abortive family planning methods, and there may even have to be considered the question of safe early legal abortion services, in some situations (W.H.O. Technical Report Series 623 omit 1978).

THE FUTURE

What does the future hold for mankind in the sphere of human reproduction? The future in the field of human reproduction seems to be promising and exciting. Although I will not wish to be presumptuous to forecast the likely developments in this field in the remote future of the 21st century, I think it is permissible for me to share with you my thoughts on the way in which advances in the field of human reproduction are likely to develop in the rest of the 20th century, namely in the 1980s and 1990s. If one is permitted to gaze into the crystal ball, exciting areas of development can be visualised.

In the area of maternal health, there will be considerable developments in the field of social obstetrics & gynaecology, particularly in the context of the developing countries; and in this region, it is hoped that Malaysia will take the lead by the establishment of a division of social obstetrics & gynaecology in the Department to strengthen the ongoing teaching and research programmes in this field for medical undergraduates and postgraduates of this Faculty. The socio-economic upliftment of the Malaysian mothers will, in turn, lead to improvements to their general health and nutrition, which will subsequently be reflected in their better fetal growth and in the birth of better babies. The improvements in the extent and quality of available obstetrics services will ensure that pregnant mothers receive maximal safety and comfort in child-bearing.

CONCLUSIONS

In my inaugural address, I have attempted to comprehensively cover the extensive benefits accruing to human health and human welfare from research in human reproduction in this 20th century. The ultimate objectives of research in human reproduction are firstly, to ensure that the society in general, the family as a unit, or the woman as an individual, is assisted in her or its endeavour to successfully have the desired number of children, at the desired pregnancy intervals, and further to ensure that every pregnancy progresses from conception to child-birth, as uneventfully as possible, with the minimal of health hazards to mother and child.

It is, thus, apparent to all of you that those of us, practising in field of obstetrics & gynaecology, are intimately concerned not only with the quantity of life at conception, but also with the quality and

quantity of both maternal and fetal life throughout pregnancy, childbirth, and thereafter!

SUMMARY

The five major causes of maternal mortality in the developing countries of the world, namely infection (puerperal sepsis), haemorrhage, hypertensive disease of pregnancy (toxaemia of pregnancy), difficult labour (dystocia) and illegal abortion (criminal abortion), have been presented and discussed. The beneficial impact that research and evolution of modern obstetric practice have had on these five major causes has been reviewed. The manner in which the future trends towards betterment of maternal health in developing countries are likely to develop has been briefly stated.

ACKNOWLEDGEMENTS

To the Honourable Vice-Chancellor, Royal Professor Ungku A. Aziz, I wish to extend my very sincere gratitude for having graciously presided at the meeting of my inaugural address, and for having introduced me with such laudable and kind remarks about my department and myself to a large audience, consisting of staff and students of the University of Malaya and University Hospital, the members of the medical profession and the public. I also wish to thank the Honourable Vice-Chancellor for giving me the honour and distinction of delivering the first inaugural address in this Medical Faculty, in its current resumed series, after a long lapse of over 12 years.

My very sincere appreciation and thanks to Mrs. Ivy Phang of my department for her excellent secretarial assistance rendered in the preparations for the manuscript of my inaugural address, for the presentation and the subsequent publications.

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MARFAN'S SYNDROME

Samuel Ong & W.H. Ng

INTRODUCTION

IN 1896, Marfan first reported a skeletal anomaly in a 5 year old girl characterised by long slender extremities. Subsequent reports described similar skeletal anomalies associated with disorders of the connective tissues of the cardiovascular system and eyes (Mckusick, 1955). This disorder, Marfan's Syndrome, is transmitted as an autosomal dominant trait with variable penetrance. Complications arising in the cardiovascular system contribute to the premature deaths in these patients, while the skeletal and ocular lesions cause considerable morbidity.

This report is of a 20 year old Malay girl with Marfan's Syndrome. The clinical features and echocardiographic findings are presented. Methods of treatment, and the causes of death in Marfan's Syndrome are discussed.

CASE REPORT

C.S., a 20 year old single Malay girl, was admitted on 10-1-79 for an upper respiratory tract infection. Further questioning established a reduced effort tolerance over the past 2-3 years. There were no past history of cardiac failure,

rheumatic fever or visual disturbances. The nuclear family history is shown in Fig. 1.

Physical examination revealed a tall, thin, young lady measuring 170 cm. in height and 185 cm. in arms span. There was hyperextensibility of the joints and arachnodactyl. A high-arched palate was detected in the oral cavity and no abnormalities were detected in the eyes. In the cardiovascular system examination, her blood pressure was 160/60 mm. of Hg. with a regular pulse rate of 80/min. which was collapsing in character. There was gross cardiomegaly due to dilatation and hypertrophy of both ventricles. A loud pansystolic murmur of mitral incompetence was audible in the mitral area radiating to the axilla and an early diastolic murmur of aortic incompetence was heard along the left sternal edge. The rest of the physical examination was normal.

Chest x-ray (CXR) confirmed cardiomegaly predominantly of the left ventricle. The electrocardiogram (ECG) showed left ventricular hypertrophy but no strain pattern (Fig. 2). The haemoglobin was 10.2 gm. %, WBC 5,800 with a normal differential and the ESR was 2 mm. in the first hour. Serum electrolytes, blood urea and anti-streptolysin O titre were normal. Blood cultures, VDRL test and LE cells were all negative.

At echocardiography, with the echo beam directed at the aortic root, gross aortic root dilatation with normal aortic valves and left atrium were seen (Fig. 3). The end systolic aortic root

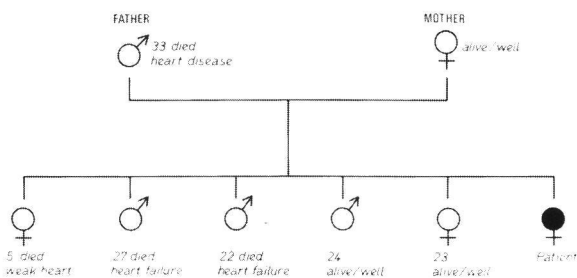


Fig. 1. Diagrammatic representation of family history of the patient.

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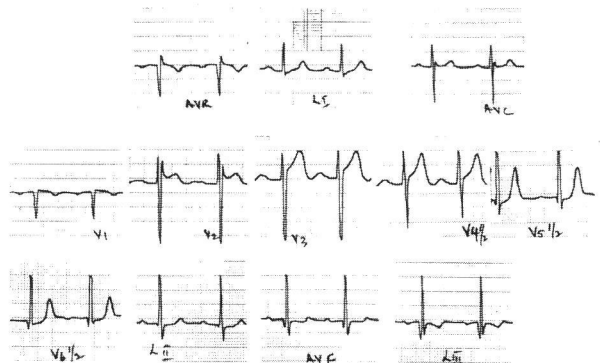


Fig. 2. ECG showing left ventricular hypertrophy.

diameter was 5.1 cm (normal 2 — 3.5 cm). There was no dissection of the aorta. In the mitral valve area (Fig. 4), fluttering of the anterior mitral leaflet indicating significant aortic incompetence, and holosystolic prolapse of the mitral valve were demonstrated.

Hyperdynamic left septum and posterior wall motion indicating left ventricular volume overload with gross dilatation of the left ventricular cavity and dilated right ventricle were seen with the echo beam directed at the ventricles (Fig. 5). The left ventricular internal diameter in the diastole was 7.8 cms. (normal 3.0 — 5.5 cm).

DISCUSSION

The association of cardiovascular lesions with Marfan's Syndrome was first noted by Salle in 1912. Goyette and Palmer (1953) in a study estimated that the cardiovascular complications occur in 30-60% of such patients. It has been shown that these cardiovascular lesions, predominantly aortic incompetence and its complications, contribute to the significantly reduced life span. Murdoch *et al.* (1972), in a study of 257 patients with the Marfan's Syndrome found the average age of death was 32 years in 74 cases. The cause of death from cardiac complications occurred in 52 of these 74 cases (70.3%). They include rupture of aortic aneurysm, dissecting aneurysm, aortic incompetence with cardiac failure, myo-

cardial infarction, infective endocarditis, cardiac arrhythmias and acute heart blocks.

Due to its non-invasive qualities, echocardiography would be an ideal method of studying the cardiovascular complications of Marfan's Syndrome. Contrary to popular belief, aortic lesions occur less frequently than involvement of the mitral valve. Spangler *et al.* (1975), in an echocardiographic study of patients with the Marfan's Syndrome, found mitral lesions in 50%, aortic lesions in 18%, and mixed aortic and mitral lesions in 15% of cases. The remaining patients had no cardiac abnormalities. The cardiovascular complications include aortic or pulmonary ring dilatation with consequent incompetence, aortic aneurysm, dissection of the aorta, mitral incompetence, varying degrees of mitral valvular or annular prolapse and infective endocarditis.

Echocardiography is used in measuring the dimensions of the aortic root, left atrium and left ventricle at initial assessment. Sequential measurements aid in assessing the progress of the disease process, thus deciding the time for cardiac catheterization or surgical intervention. Detection of aortic dissection and aortic aneurysm and its progression

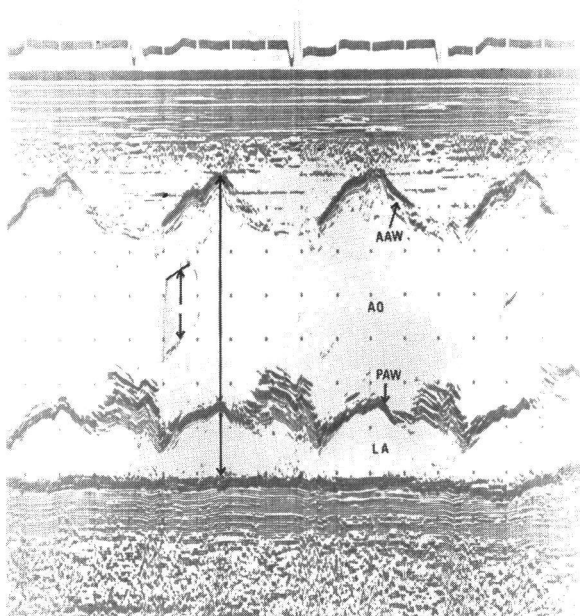


Fig. 3. Echocardiogram of the aortic root showing gross aortic root dilatation; normal aortic valves and left atrial size. (AAW — anterior aortic wall, PAW — posterior aortic wall, LA — left atrium, AO — post-AV — aortic valve)

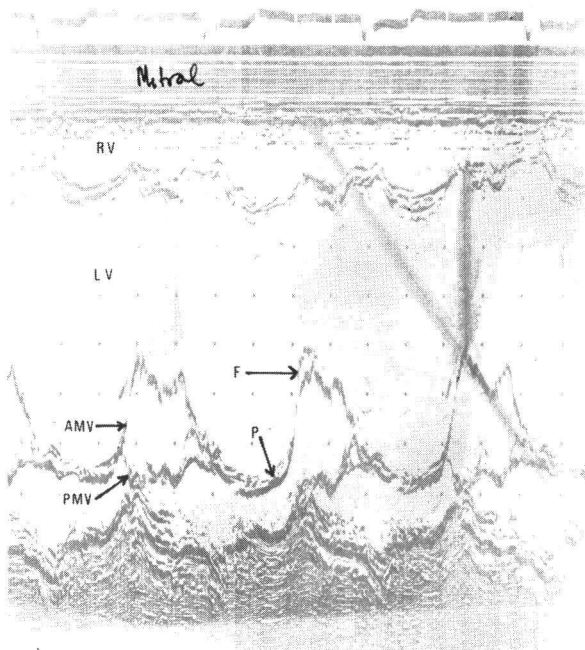


Fig. 4. Echocardiogram of the mitral valve showing fluttering of anterior mitral leaflet of aortic incompetence, and prolapse of the mitral valve. (RV — right ventricle, LV — left ventricle, AMV — anterior mitral valve, PMV — posterior mitral valve, F — fluttering of anterior mitral leaflet, P — prolapse of mitral valve in systole).

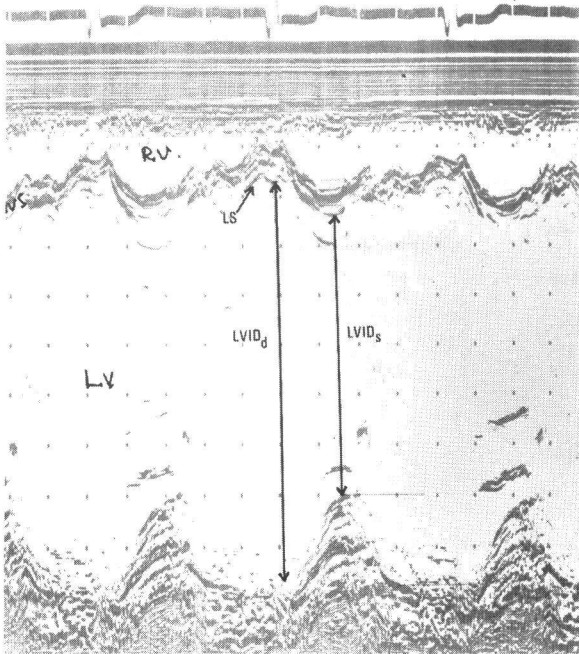


Fig. 5. Left ventricular echocardiogram showing left ventricular volume overload and bi-ventricular dilatation. (LVIDd — left ventricular internal diameter in diastole, LVIDs — left ventricular internal diameter in systole, LS — left septum).

may also be made echocardiographically (Nanda, Gramiak and Shah, 1973; Kronzon and Mehta, 1974). It may also detect mitral valvular abnormalities in the absence of clinical signs or radiological changes.

Medical treatment is directed primarily to the prevention of the progression of the cardiovascular complications, especially in situations of dissecting aortic aneurysms and aneurysmal rupture. Reserpine and hexamethonium have been shown to decrease myocardial contractility, which is the more important factor than the lowering of blood pressure in preventing aortic dissection (Beaven and Murphy, 1956). The beta-blockers, a new anti-hypertensive and anti-anginal agent, also decrease myocardial contractility. However, few studies of its use in Marfan's Syndrome have been reported. Halpern *et al.* (1971), in a preliminary trial with propranolol claimed encouraging results. They however cautioned that it remained to be established that long term beta-blockade could prolong life in such cases. Patients with combined aortic and mitral insufficiency, as with this patient, have a rapidly deteriorating

clinical course with extremely high mortality. Surgical correction of aneurysms and prosthetic valve replacement of defective valves can be offered in the management of these patients. Nelson and Vaughn (1969) reported good results with double valve replacement in the Marfan's Syndrome. Similarly Singh and Bentall (1972), obtained encouraging results with complete replacement of the ascending aorta with aortic valve replacement in the treatment of aortic aneurysm.

As seen from Fig. 1, the family history of heart disease with premature deaths, presumably from Marfan's Syndrome, is strong. Cardiovascular assessment of the surviving members would detect complications arising from the Marfan's Syndrome and also serve to chart their progress.

SUMMARY

A case of Marfan's Syndrome is described. Echocardiographic features and the role of echocardiography in the management of such patients are discussed. The methods of treatment are also highlighted.

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NOTICE TO CONTRIBUTORS

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All manuscripts should be submitted in duplicate to Professor Paul C.Y. Chen, Hon. Editor, Medical Journal of Malaysia, c/o Faculty of Medicine, University of Malaya, Kuala Lumpur 22-11. Manuscripts should be typed on one side of quarto paper in double-spacing throughout (including tables, legends and references), with wide margins. The title page should include the title of the paper, initials and name(s) of the author(s), degrees and address. Introduction, materials and methods, results, discussion, summary, acknowledgements and references should follow. Scientific names and foreign words must be underlined. Papers may be submitted in Bahasa Malaysia but must be accompanied by a short summary in English.

Tables and Illustrations

Each table should be typed on a separate sheet of paper in double-spacing and should be fully labelled so as to be comprehensible without reference to the text. The contents of all tables should be carefully checked to ensure that all totals and subtotals tally. All measures should be reported using the metric system.

All illustrations and diagrams should be in Indian ink on separate sheets of thick, smooth white paper or Bristol board or in the form of photographs printed on glossy paper and should be

larger than the finished block, to allow for reduction. They should bear on the reverse side the author's name, short title of the paper, the figure number and an arrow indicating the top of each illustration. All figures should be fully labelled so that each is comprehensible without reference to the text. Legends and captions should be typed on separate sheets and numbered correspondingly.

All illustrations and diagrams should be referred to as figures and given arabic numbers, while tables should be given roman numbers. Their approximate position in the text should be indicated. Illustrations and tables should be kept to a minimum.

References

References to the work of other authors should be cited in the text according to the following convention:

Peck and Lowman (1970) demonstrated
It was demonstrated (Peck and Lowman, 1970)
that
The survey (Meyers *et al.*, 1971) showed

For works written by more than two authors, the first author only is named followed by the words *et al.* as shown above.

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